GAS JOURNAL

LIGHT ∴ HEAT ∴ POWER

BY-PRODUCTS.

Founded in 1849 as the "Journal of Gas Lighting."

VOL. CCXI.

JULY TO SEPTEMBER, 1935.

LONDON:

WALTER KING, LTD.,

11, BOLT COURT, FLEET STREET, E.C. 4.

1935.

...ed as a Newspaper.

JUL 16 1935

GAS Journal

LIGHT · HEAT · POWER · BYE-PRODUCTS

Vol. 211. 87th Year. LONDON, JULY 3, 1935. No. 3763. Price 1s.

OXIDE OF IRON
SPENT OXIDE
Gas Purification & Chemical Co.
— LTD. —
PALMERSTON HOUSE, LONDON, E.C. 2

NEW CONTINUOUS TAR DISTILLING PLANT
NO POT STILL — Wilton — ALL CAST IRON
PLANT WORKING THERMOSTATICALLY AT WELLINGBORO'

"LUX"
Gas Purifying Material
Send your Enquiries to—
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EWART'S GEYSERS
"Just Turn The Tap"
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Thomas Glover
& Co., Ltd.,
METERS
See Advert. on p. 20

AUTOMATICALLY OPERATED
"SIMPLEX"
WATER GAS PLANT
VERTICAL GAS RETORT SYNDICATE LD.
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RUSTLESS SELF-LOCKING METER
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Be sure you get the genuine article. Look for the Patent NUMBER
CHEAPEST IN THE LONG RUN
H. MITCHELL & CO., 3 & 5, LEIGHTON ROAD, N.W.5

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"FERRODOR"
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Made with "Ferrodor" Ore—an incorrodible pigment with flaky particles which lie flat and overlap one another like the scales of a fish, forming a perfect protective shield against the ravages of the weather and atmospheric corrosive agencies.
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GAS WATER HEATERS
SOLVE EVERY DOMESTIC WATER HEATING PROBLEM

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WHICH ARE FAMOUS FOR THEIR
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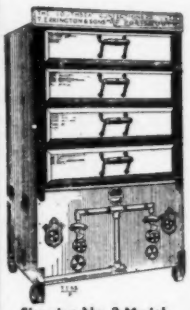
for Hotels, Pie-Makers, Bakers and Confectioners



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Multi-blade Rotary type

FOR AIR OR GAS

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This machine embodies features which give

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than other machines of the multi-blade type.

Can be used also as a Compressor or Exhauster.

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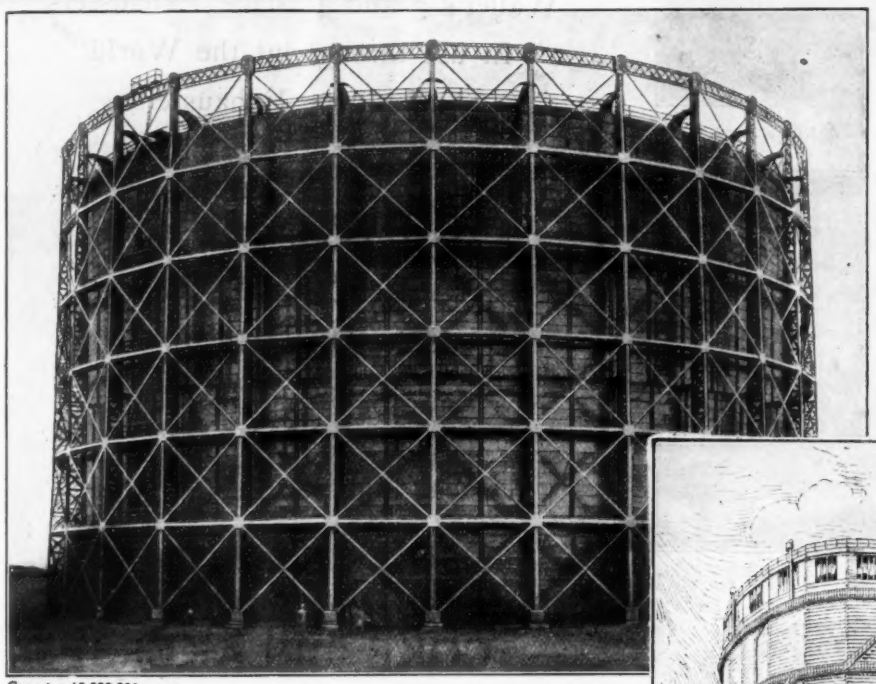
Gas Journal

LIGHT · HEAT · POWER · BYE-PRODUCTS

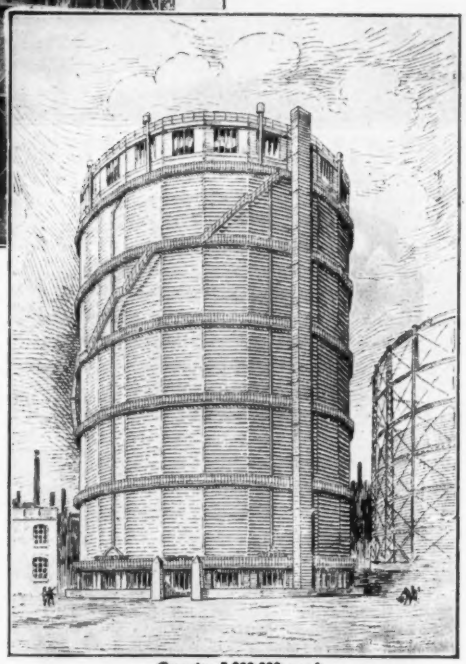
[Founded in 1849 as the "Journal of Gas Lighting."]

Vol. 211. 87th Year. LONDON, JULY 3, 1935. No. 3763. Price 1s.

EXTRA YEARS OF RELIABLE PROTECTION



Capacity 10,000,000 cu. ft.



Capacity 5,000,000 cu. ft.

Not only do "FOOCHOW" Paints give the maximum years of reliable protection — as PROVED BY CONCLUSIVE EXPOSURE TESTS —but are also the proved best medium for PREVENTING AND ARRESTING CORROSION under the film.

These statements rest on over 50 years' intimate association with Gas Works requirements and scientific investigation into the causes and effects of corrosion.

Fullest particulars and data are at your disposal.

The large gasholders shown were painted with **"FOOCHOW"** *after years of comprehensive exposure tests*

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In proved Fast Colours

PERMANENT GREENS - SUBLIMED BLUE LEAD PAINTS, etc., etc.

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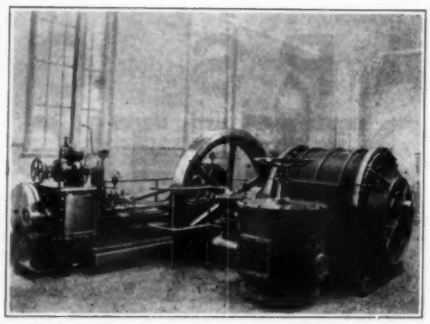

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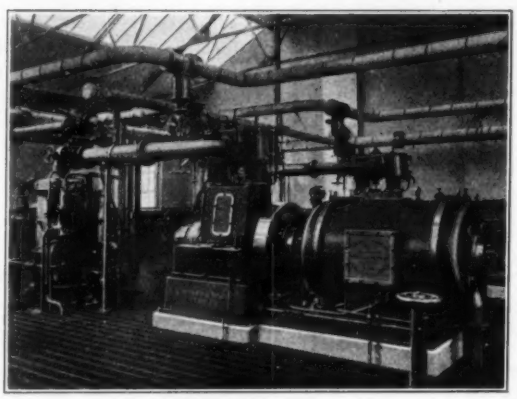
Waller's 3 and 4 Blade Exhausters.
In use throughout the World.
Turbo-Type Exhausters.



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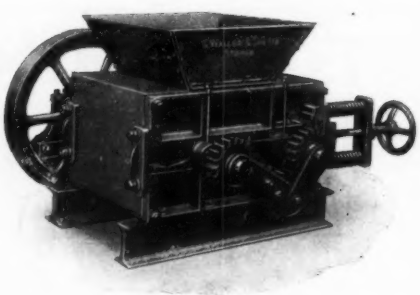

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Waller's Improved Phœnix Model
Heavy Construction
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Pumps for Gas Works
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"ALL LAMP COLUMNS WILL BE CONCRETE—SOON"

We hear that the Mean Relative Humidity of Torquay is 78% (our relatives of that age are rather mean, too), and that Drake started his "drumming" from thereabouts. So with all humidity (sorry, humility) we are going to try some drumming, too. We are attempting to drum into you the fact that if our columns are good enough for Torquay, they are good enough for most places. And if you'll look at the illustration and read these advantages, we feel sure you will agree:—

1. **No maintenance cost. Need no paint.**
2. **Stronger than Cast Iron and cannot corrode.**
3. **Will withstand severe shocks.**
4. **Competitive prices.**
5. **12 designs and heights available immediately.**

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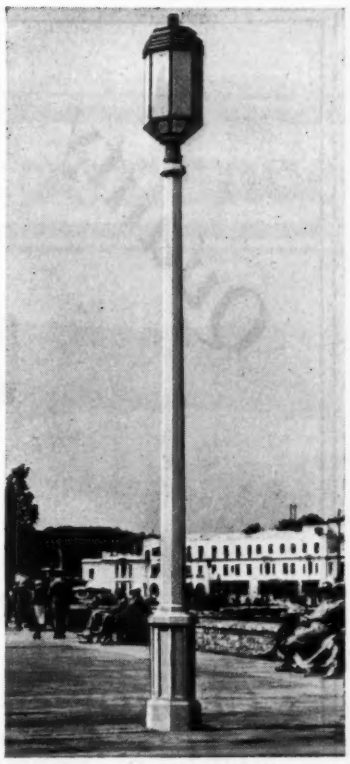
Sole distributors to the Gas Industry.

The photograph shows one of our columns in Torquay.



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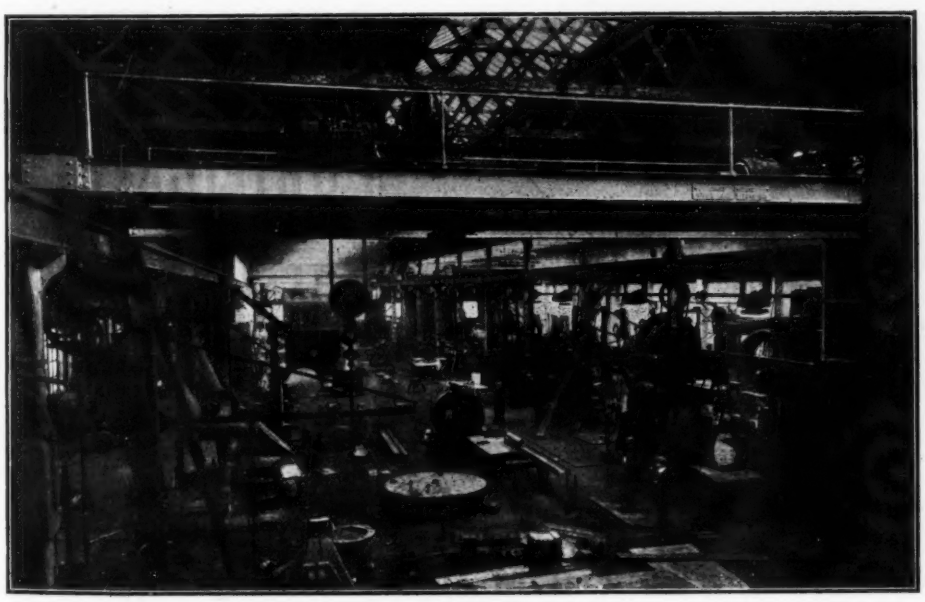

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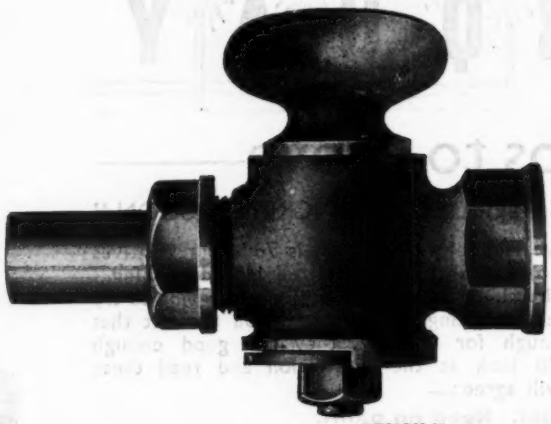

DESIGN No. 50

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GEORGE ORME & CO.
(Branch of Meters Ltd.)
ATLAS METER WORKS
OLDHAM

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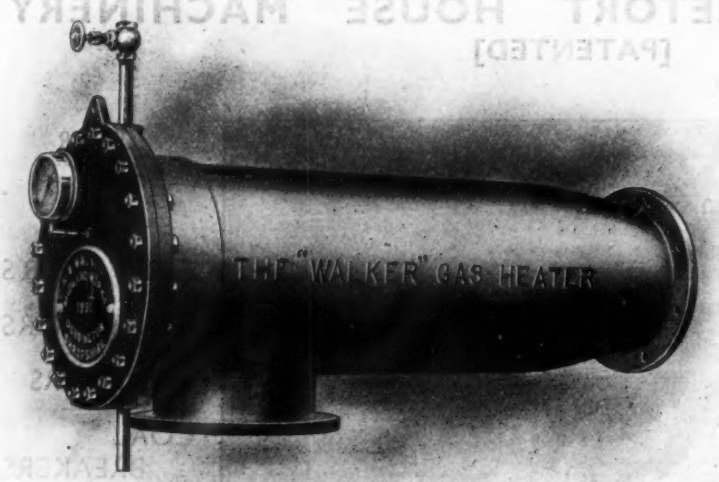
SAMPLES & PRICES



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ASSISTS
PURIFICATION
BY
UTILIZING
WASTE HEAT
IN
EXHAUST STEAM

SUITABLE ALSO FOR LIVE STEAM

MADE IN SIZES FROM 6" UPWARDS

C. & W. WALKER LTD.
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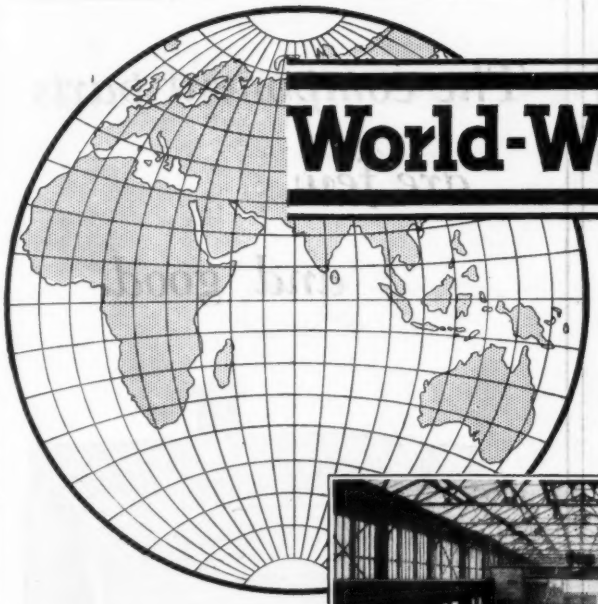

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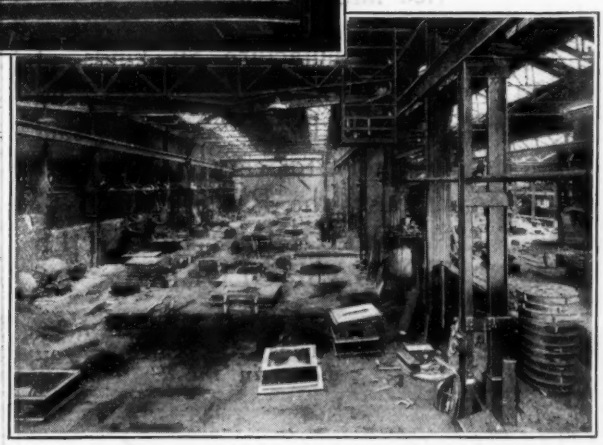
General View
No. 6 Machine Shop.



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Practical Co-operation

When you call upon the wide experience of Head, Wrightson you are assured of a personal, helpful co-operation not always available in organisations of their size.

Whether the order is for a small casting; or the supply and erection of a complete plant, Head, Wrightson can deal with the matter expeditiously, with the minimum of "red tape" and the maximum of service.

HEAD, WRIGHTSON & Co. LTD.

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SUMMER TIME

from the 14th

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Now is a favourable time to proceed with the construction of new Plant and the reconditioning of Plant which will be required for service later in the year.

We manufacture all kinds of Plant for Gas Works, and having a large "outside" staff are able to carry out expeditiously the RE-SHEETING AND ADDING OF LIFTS TO GASHOLDERS.

We should be pleased to have your enquiries for schemes you have in mind.

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GAS PLANT MANUFACTURERS
PARKFIELD WORKS, STOCKTON-ON-TEES

The component parts are few and good.

May we send you a sample?

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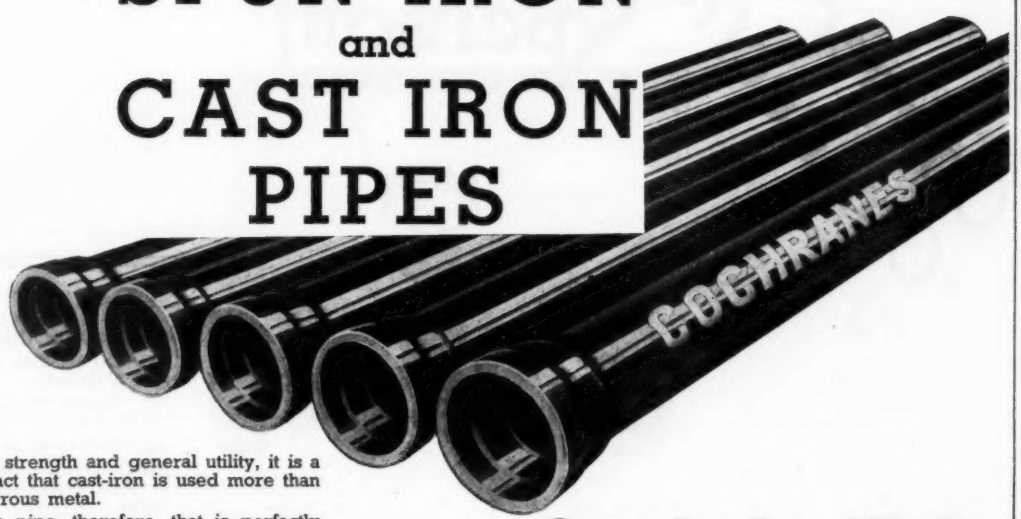
Cochranes (Middlesbro') Foundry Limited

SPUN IRON
and
CAST IRON
PIPES



For long life, strength and general utility, it is a recognised fact that cast-iron is used more than any other ferrous metal.

By offering a pipe, therefore, that is perfectly concentric by virtue of the centrifugal process, and of unusually high strength, Cochranes have established their Spun Iron pipe as an ideal medium for water, gas and sewerage conveyance.

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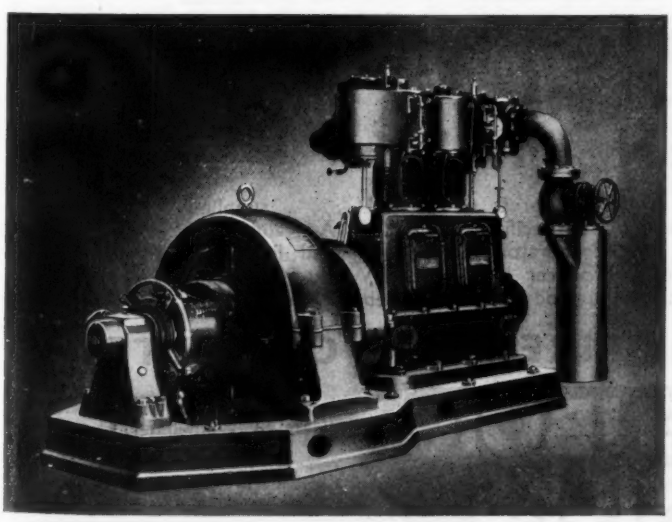

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please ask us to quote for or instruct your Contractors to include, E.C.C. generators and switchboards

BECAUSE

we have successfully equipped hundreds of Gas Works with electric generating plant.

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REGISTERED TRADE MARK

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ADVANTAGES.

INSTANTANEOUSLY MADE.
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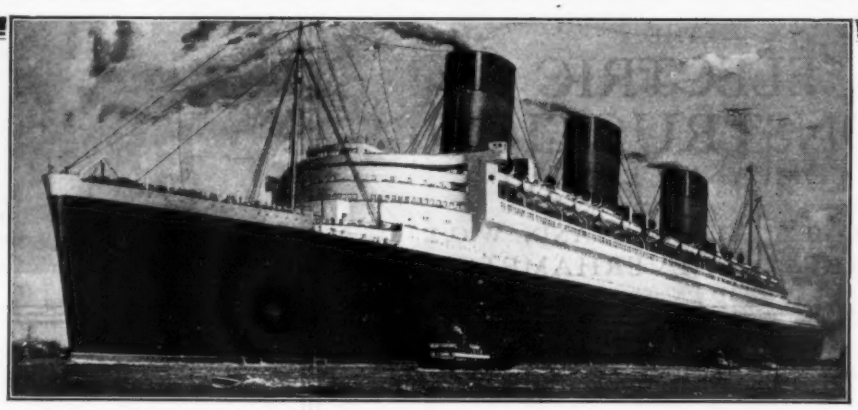

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. . . used also for the furnaces of the "Empress of Britain" . . . supplied regularly to the British Admiralty . . . specified for use in Annealing and Welding Furnaces, Steel Furnaces and Regenerators, Soaking Pits and Reheating Furnaces, Mill Furnaces and Cupolas, Producer Linings, Gas Works, etc., and, in fact, for any place where a really good first-class firebrick is required.

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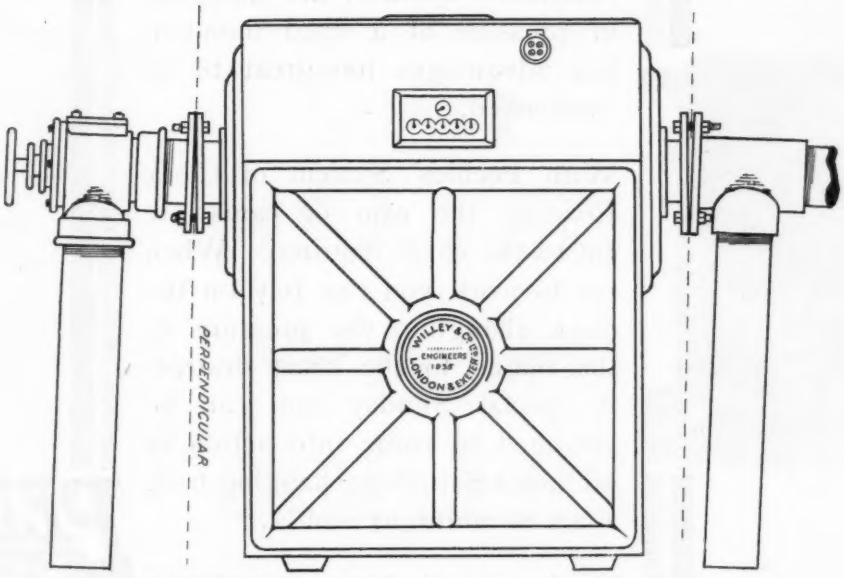
AN OUTSTANDING IMPROVEMENT IN BIG METER CONSTRUCTION



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LARGE METERS—by virtue of their size and ponderosity — MUST STRAIN AT CONNECTIONS.

OUR PATENT FLEXIBLE BOSSES to carry the Flanged Connections SAVE STRAIN ON METER CASING.

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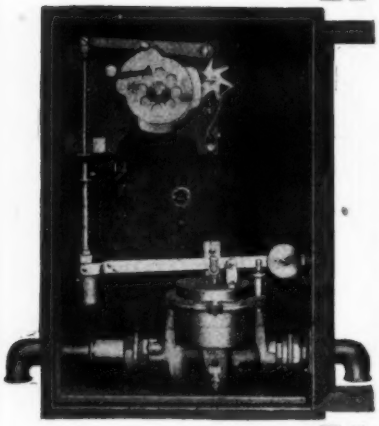
The advantage to you of Peebles Clock Loading



Automatic Control, the changing of pressure at a fixed moment, has advantages too great to be overlooked.

With Peebles' System of Clock Loading the cam or cams are cut to the chart required. When set to work you can rely on the clock changing the pressure in the mains to the chart desired. A special Sunday cam can be arranged to come into action at midnight Saturday, changing back again at midnight Sunday.

Particulars of this neat, reliable, and inexpensive method will be sent on request.

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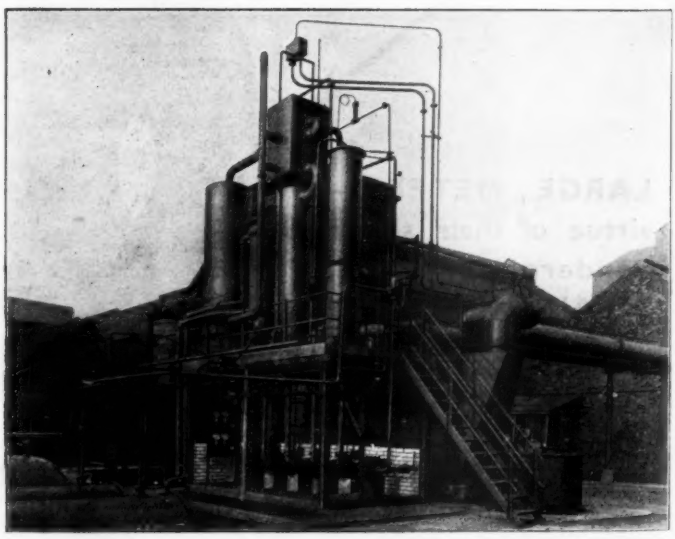
Complete
BENZOLE RECOVERY PLANTS



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THERMOSTATIC AND CENTRALISED CONTROLS. ROBUST CONSTRUCTION. MINIMUM ATTENTION. Over 30 years' experience in the construction and operation of BENZOLE PLANTS.

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In WASH BOILERS that are UP-TO-DATE and TROUBLE FREE

GAS HEATED WASH BOILERS

No. 11 Pattern
with Strong Galvanized Case, Polished Pressed Aluminium Top Rim. Protector Case. Copper or Wood Lid and Brass Draw-off Tap.

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Galvanized Iron Case. Rim of Cast Aluminium. Copper lid heavily tinned on inside. Protector Plate, with or without draw-off Tap.

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with white Porcelain Enamelled Table Top. Grey Mottled Porcelain Enamelled Case and Chromium Plated Tap.

No. 13 Pattern
Galvanized Corrugated Case, Polished Pressed Aluminium Rim. Copper or Wood Lid. Protector Case and Brass Draw-off Tap.

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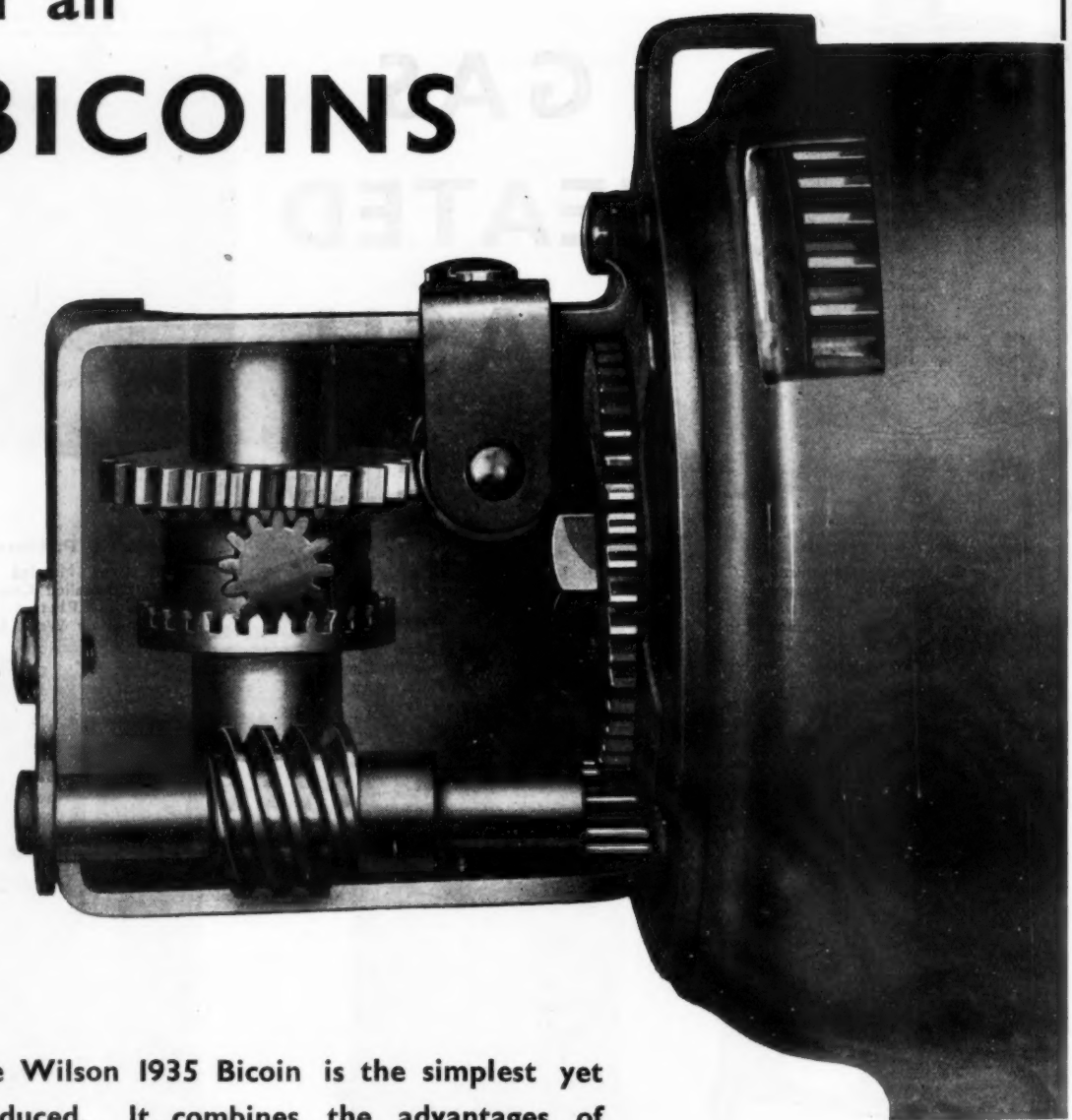
The Simplest of all BICOINS



The Wilson 1935 Bicoin is the simplest yet produced. It combines the advantages of the consumer's Optional Meter, with the simplicity and reliability of a single coin attachment.

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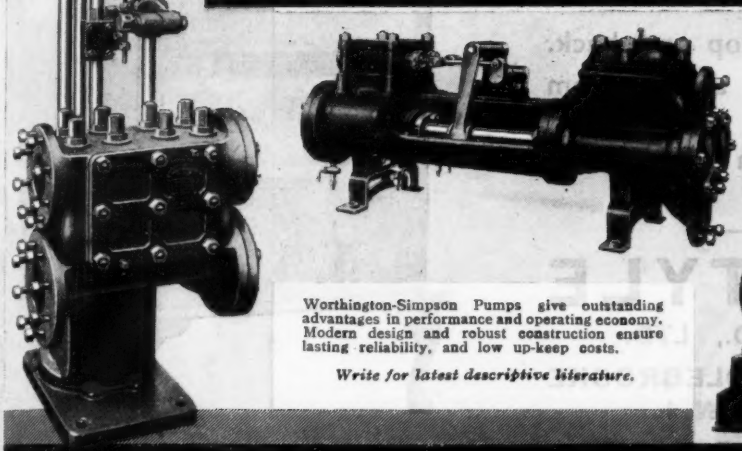
GEORGE WILSON GAS METERS LIMITED

COVENTRY - LONDON - MANCHESTER - BLACKPOOL - LEEDS

WORTHINGTON—SIMPSON

PUMPS FOR THE GAS INDUSTRY



Efficient and economical units for Boiler Feeding, Quencher Work, Ammonia Liquor, Brine, Water Circulating, and General Service. Types and sizes supplied for all requirements.

Worthington-Simpson Pumps give outstanding advantages in performance and operating economy. Modern design and robust construction ensure lasting reliability, and low up-keep costs.

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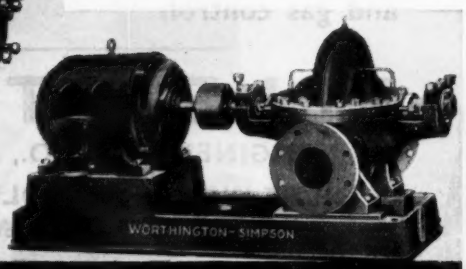

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MAINS

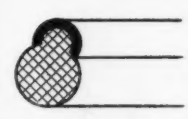
"EVERITE" Asbestos-Cement PIPES FOR GAS MAINS

Immune from corrosion, electrolytic action, light in weight and economical in cost.

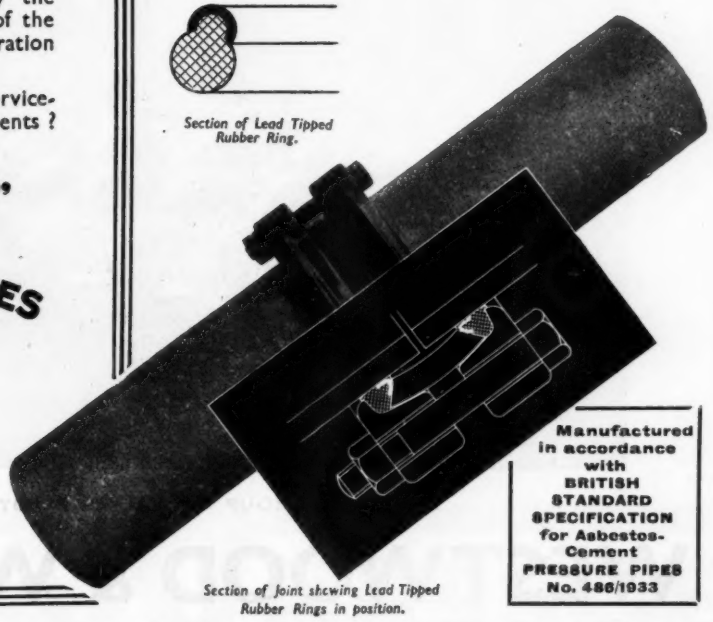
They are joined with flexible Detachable Joints with Lead Tipped Rubber Rings which completely protect the rubber from possible attack by the contents of the main, and yet the resilience of the rubber provides a joint which thrives on vibration and prevents any possibility of leakage.

May we send you full particulars of these serviceable pipes or quote you for your requirements?

"EVERITE"
REGD. TRADE MARK.
ASBESTOS-CEMENT PIPES FOR GAS MAINS



Section of Lead Tipped Rubber Ring.



Section of Joint showing Lead Tipped Rubber Rings in position.

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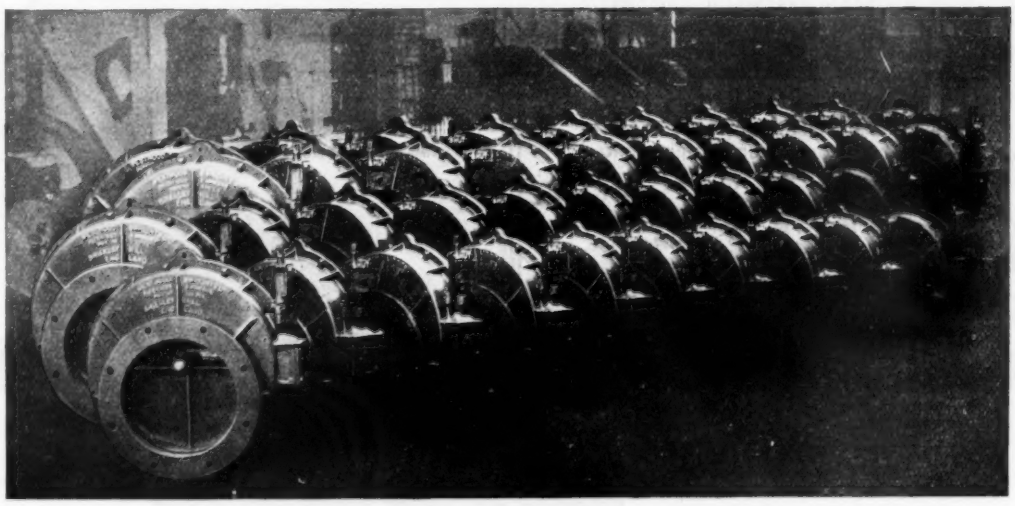

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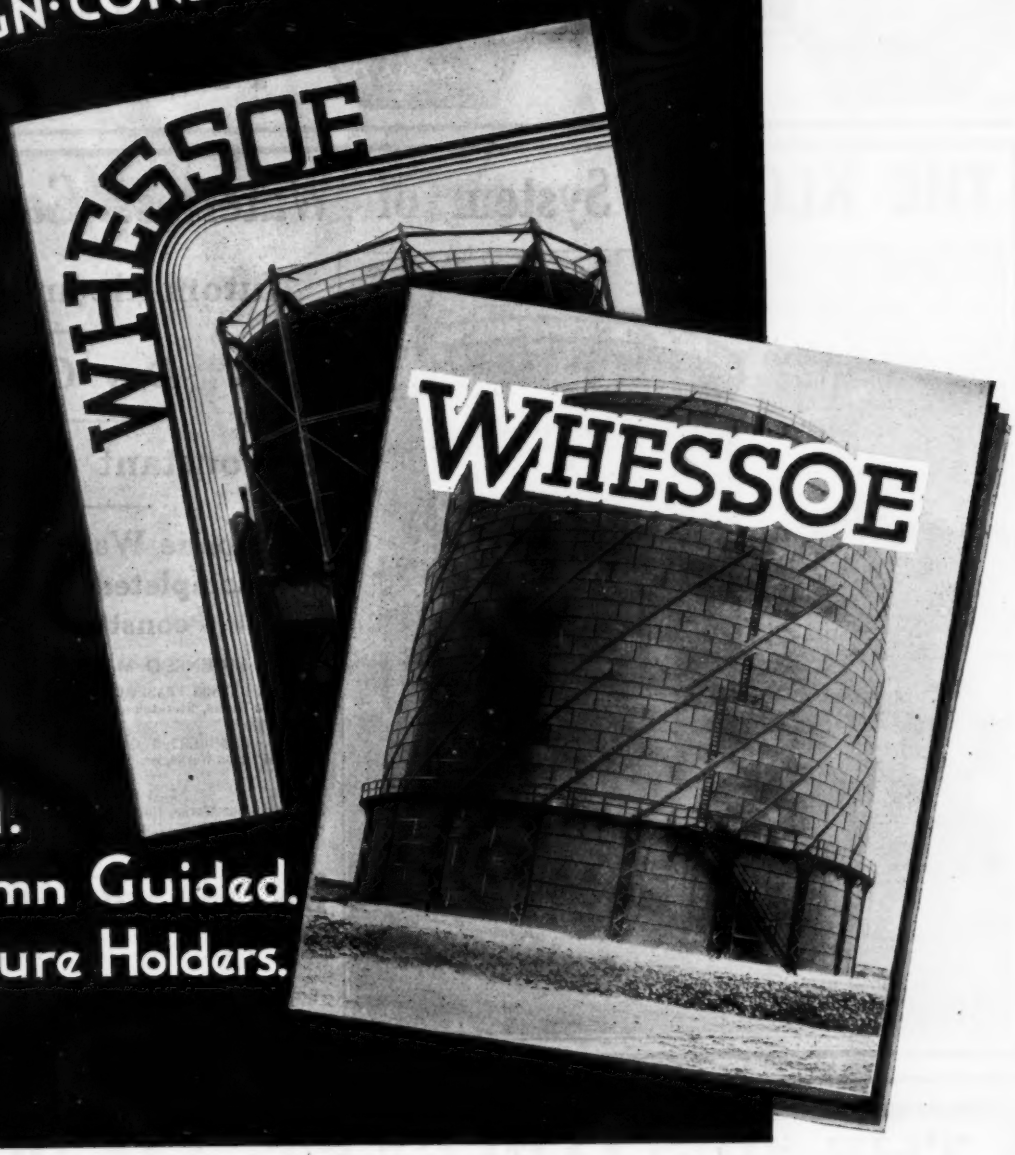

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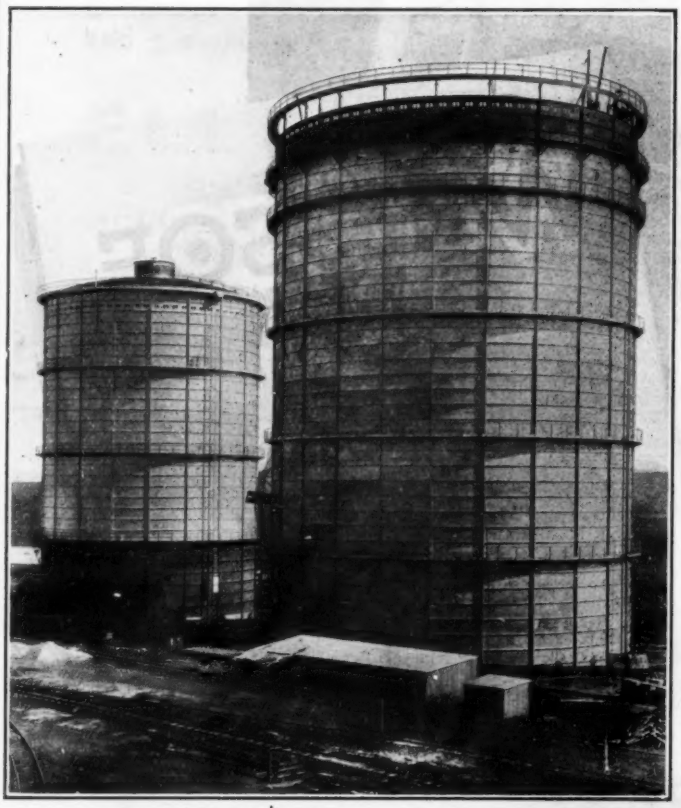

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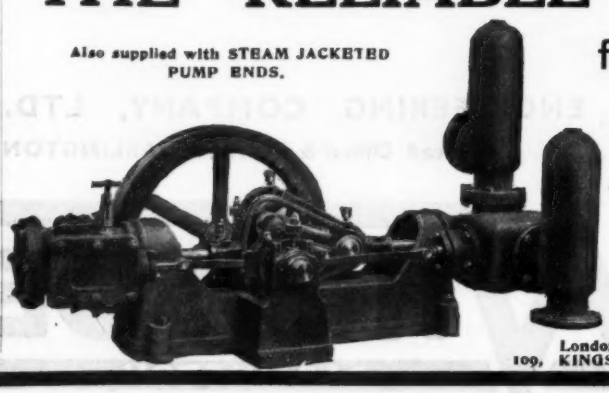

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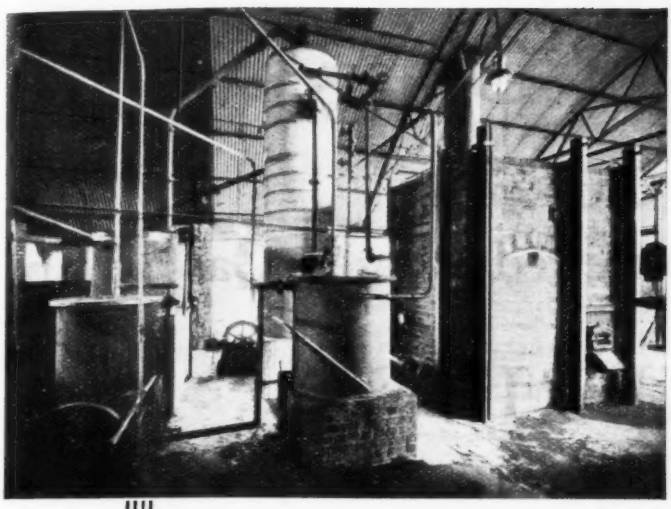

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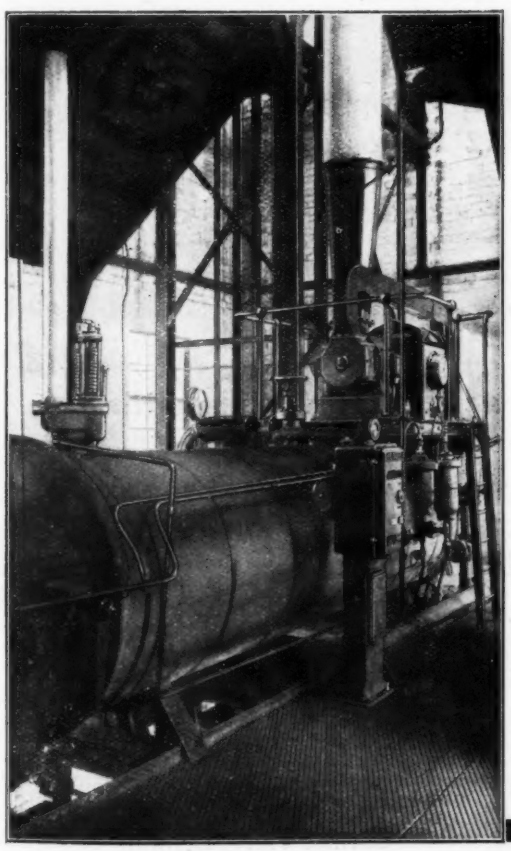

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**Computed by the method described in the Proceedings of The Institution of Gas Engineers, 1927-8, p. 526.*

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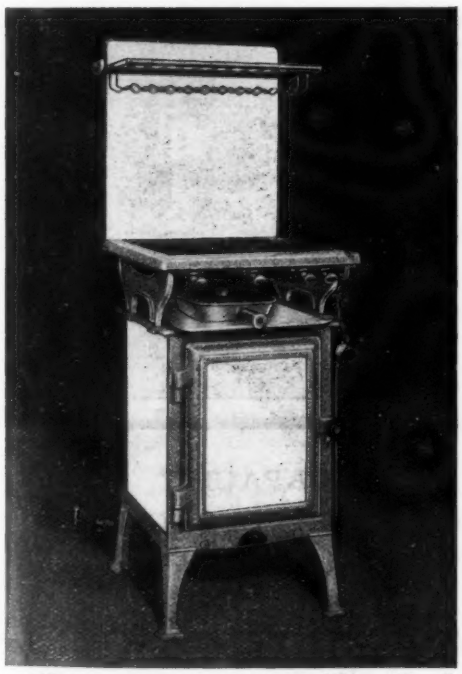

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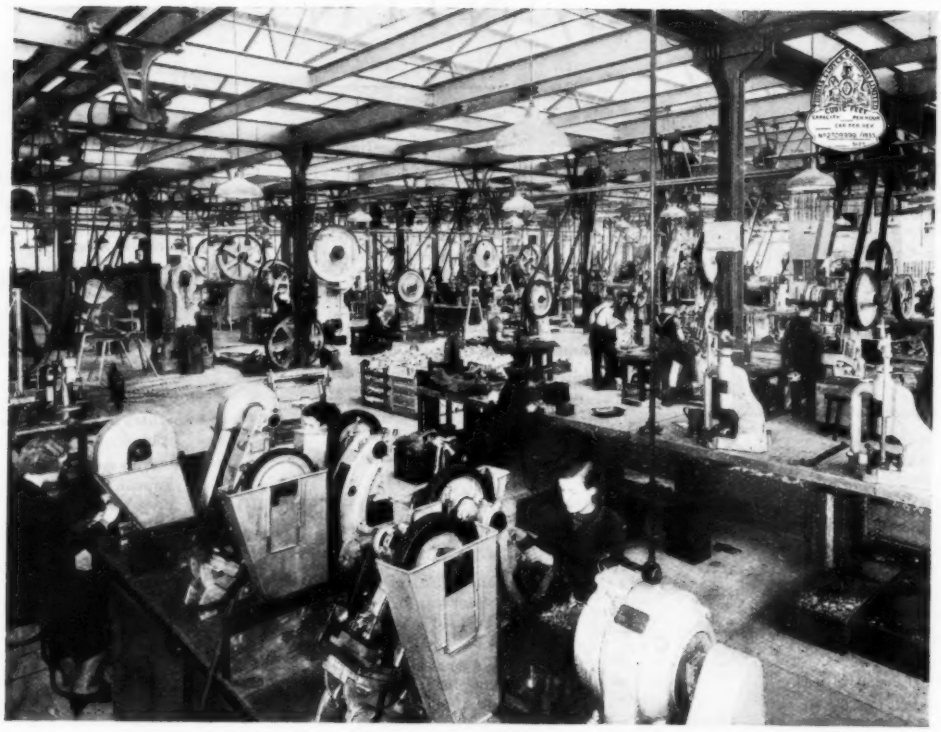

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Gas Journal

JULY 3, 1935

Vol. 211. 87th Year No. 3763

Editorial Notes

Up Against It

THOUGH giving credit to his immediate predecessor for having done much "to clean up the mess," Mr. E. Shiell found a very nasty legacy from the past when, four-and-a-half years ago he took up the position of Engineer and Manager to the Langholm Gas Company. The state of affairs is graphically described in his most frank and courageous Presidential Address to the Waverley Association of Gas Managers which he delivered in Edinburgh last Friday and which is published in our issue to-day. Mr. Shiell does not blink facts, and he finds some of them exceedingly hard. They certainly are hard. He states quite simply that up to a few years ago the attitude of the Company was to be indifferent to the consumers' needs while neglecting works, plant, and mains. It is a horrid story. In 1927 the price of gas was 9s. 2d. per 1,000 cu.ft., the whole plant in "a deplorable state of disrepair," and the public thoroughly antagonistic. The unaccounted-for gas figure was "enormous."

In 1931, Mr. Shiell rolled up his sleeves and set to work to remedy conditions which were obviously jeopardizing the existence of the Undertaking. He attended first to the gas making plant and installed a new holder. At that time the storage consisted of a 65-year old gasholder of 16,000 cu.ft. useful capacity, while the daily output was 50,000 to 60,000 cu.ft. Then he turned his attention to the district, faced with an unaccounted-for gas figure of 22%. He found broken mains in a state of temporary repair, and a large number of services, still connected to the mains, left to rot. Pipe plans were non-existent. On one occasion half his consumers were supplied with water instead of gas. Considering the size of the Company a large outlay was necessary for repairs and renewals, but the unaccounted-for gas has now been reduced to 11%, and service to the consumer transformed.

Mr. Shiell's Campaign

NEXT came a concentrated and sustained effort to increase consumption per consumer, which stood at 8,500 cu.ft. per annum. Hire-purchase of cookers was inaugurated as also was the "pay through meter" sale of fittings, and, bearing in mind the difficulties which Mr. Shiell had to encounter, we think he has done well in increasing the average consumption to 10,000 cu.ft. He introduced a block scale of charges, which, while it has reduced the number of unremunerative consumers, has, in Mr. Shiell's words, "proved a failure." This statement, we suggest, requires qualification. Introduction of the block scale coincided with the advent of electricity, the Dumfriesshire County Council being the distributing and selling agency. During the first year of activity electricity pirated 20% of the Langholm Company's business. Since then the Company has regained 12%, and we think that the picture would have been much worse had it not been for Mr. Shiell's sales campaign and the block system which, even if it did not receive the recognition it deserved, at any rate reduced the price of gas from 6s. 8d. to 5s. 7d. per 1,000 cu.ft. He regards the reduction as "an unappreciated gift to the public." We would ask him whether he feels he would have been as well able to cope with the electrical onslaught at the old flat rate of 6s. 8d. per 1,000 cu.ft., equivalent to 19·3d. per therm.

Also, we suggest that Mr. Shiell might do something to make his consumers aware of the benefits they are receiving. An analysis of consumers' accounts over the past eight years might reveal some astonishingly good propaganda material if this is linked up with sales talk contrasting the improvement in service between now and then. Mr. Shiell has a good story to "put across," and we think that such a story would help him in his water heating campaign, regarding the results to date of which he is so pessimistic. In his area only one house in twelve has domestic hot water supply. This would seem fertile ground; yet he confesses to failure of his attack on this valuable load. We suggest he should take fresh heart and perhaps apply different methods. The possibilities are there, and it is surprising what a sales force even one satisfied consumer can be. His block rate should help him considerably in this direction; and this in spite of severe competition and the fact that his manufacturing and distributing costs amount at the moment to 12·83d. per therm. In which regard Mr. Shiell speaks of the coke market in Langholm, which he has to look at with envious eyes. The gas making plant consists of two small beds of horizontal retorts—one as stand-by—and complete gasification plant. Of the coke demand he can only supply 5%. He watches 95% of this trade passing his door. On the other hand, it must in fairness be emphasized that the capacity of his gas making plant is greatly in excess of present demands, and consequently

the price at which he can manufacture gas is not a true index of the combined process of carbonization and complete gasification. This price is bound to come down with increased sales, and we think that Mr. Shiell took the only wise course in making the rates to his consumers more attractive.

Other People's Jobs

THOSE of us who are privileged to attend the meetings of the "oldest gas association in the world" realize the spirit in which they are held and appreciate the fact that a Waverley Presidential Address is taken at its true value, and accorded no more unmerited respect than is a junior association Paper. The criticism of undue pessimism which we have suggested was also freely voiced in the discussion on Mr. Shiell's Address, but not unmixed with admiration, which we also freely endorse, for the very interesting way in which he told his story. We are inclined to wonder whether Mr. Shiell did not perhaps intentionally allow the note of pessimism to intrude in order to draw the fire of critics at the meeting; he was certainly able to convince them before the end that he is a very long way off throwing in the sponge.

We think that an occasional glimpse of this kind into other people's jobs is very salutary. Perhaps those of us who are faced with less tough propositions hardly realize what it means to be gas manager in a sparsely populated rugged district whose 2,300 inhabitants are suffering from stagnation of their own particular trade, and then to be swooped upon by an electricity supply scheme which possesses powers to draw upon public funds by increased taxation if it cannot pay its way without. Yet Mr. Shiell does not invoke the aid of, nor believe that any advantage could possibly be forthcoming from, the method of amalgamation by which a "series of isolated gas concerns are joined by a financial pool." We doubt whether Langholm, from Mr. Shiell's graphic description of it, is the kind of proposition which is likely to tempt the financial pools to which he refers. But we believe, if the Gas Undertaking there, as well as others in like circumstances, just get on with their job as Mr. Shiell is doing, without being too shocked or dismayed at the license which is accorded to the opposition, the Gas Industry will yet receive the recognition which is its due.

A Gas-cum-Coke Policy

FOR long we have emphasized that the Gas Industry sells two smokeless fuels, one in fluid form, the other as a solid, and that every effort should be made to advance the sale of both these economical and labour-saving forms of heat. We have, of course, gone further than this in maintaining that the Gas Industry is a great chemical industry of unlimited scope. Others are sharing our views. To-day we publish in full the written contributions to the discussions on the Papers presented at the Annual Meeting of The Institution of Gas Engineers, together with the authors' replies; and we would call attention here to a passage, as follows, from the comments of Dr. Foxwell: "The proper way to regard the manufacture of gas is not to accept it as an article of faith that the Industry exists for the purpose of making and supplying gas and nothing but gas, and that anything else is a by-product. Every product may be of equal importance if handled to the best advantage, though, of course, some must have a greater effect on the economics of the process than others. The Gas Industry is one phase of a larger industry that exists for the purpose of turning coal into products of more use to mankind than is the raw material. If that view be taken and each product be extracted, prepared, and marketed to the best advantage, the very best step will have been taken towards improving the Industry and cheapening the cost of manufacturing gas." To which, of course, we reply "Hear, hear."

For the moment, however, we confine our attention to gas and coke. Now coke admittedly is not as convenient as gas, but with gas ignition it is the most convenient of solid fuels. Also the price at which gas can be sold depends largely on the revenue from coke, and there is no doubt in our mind that this revenue can be very greatly increased, and also that it should be. In the Paper on the Preparation, Marketing, and Utilization of Coke which Mr. Boon, Manager of the London and Counties Coke Association, presented at the Institution Meeting, the author agrees with us that there ought to be no anomaly in the Gas Industry selling successfully two fuels regarded in certain quarters as competitive. A wise policy will develop coke as a complementary and remunerative supplementary fuel to gas. It is, in fact, essential that the Gas Industry should take full advantage of all and every means to increase its revenue from coke, because of the effect which this would have on the price of gas, to which at present coke contributes between 1½d. and 2d. per therm. Dr. Foxwell's remarks, to which we have referred, are from his contribution to the discussion on Mr. Boon's Paper, and the number who joined in the discussion, both oral and written, is evidence of the growing realization that coke is of importance to the Gas Industry and should not be treated as a "residual."

In these columns we have adduced evidence to prove that the sale of coke for use in the open firegrate does not mean a decrease in the sale of gas, but is a substitution for raw coal. Further evidence is given by Mr. Boon in his Paper, and support was forthcoming from Mr. Chandler, of the Tottenham and District Gas Company, which Undertaking has so skilfully and successfully dealt with the development of coke sales. Last year the Company fixed more than 3,500 coke burning grates, and experience has shown that substitution of a coke grate in place of a gas fire is so rare that it does not constitute a situation of a serious character. Mr. Boon's carefully compiled figures demonstrate that in no case could more than 16% of replacements of coke fires for gas fires ever be discovered, and normally the figure is 6%. In either case the increment in gas load for the gas ignition of the coke grates is greater than that lost in the displacement of gas fires. How much better it is, says Mr. Chandler, to replace a gas fire which in any event is to be removed, by one which utilizes both gas and coke rather than raw coal.

The Open Coke Fire

UNQUESTIONABLY the open coke fire presents one of the best possible markets for gas coke, and it can be exploited to considerably greater advantage than has generally been the case. There are, of course, two methods of tackling the sales of coke in this direction. One is to produce a coke specially suited to the ordinary coal burning grate, and the other to provide a coke grate complete with gas ignition which will consume with every satisfaction coke as at present produced by gas undertakings—provided, of course, that this coke is properly prepared and sized for the market. We therefore regard it as a wise policy for gas undertakings to do all possible to push the sale of gas ignited coke grates. The capital outlay for a new coke grate is small, on an average about £3, after which all the economies of burning coke can be enjoyed. What economies can be effected are indicated by the written contribution by Mr. James Carr, of Stretford, to the discussion on Mr. Boon's Paper. Particular attention

should be paid to encouraging builders to install coke grates in new property. An example of what can be done in this respect is provided by the Oldham Corporation, for whom estates in Oldham and Royton are to be installed with 800 and 1,500 open coke grates respectively.

We are not suggesting that undertakings should not endeavour to produce a solid smokeless fuel for burning in the ordinary domestic grate as at present installed. What can be done in this respect has been shown by the Liverpool Gas Company, among others. At the same time, all-purpose coke will burn all the better in a coke grate, and it surely is a great selling point in days when labour saving means so much that the coke grate is fitted with gas ignition. It is a selling point for any fuel, and is not a confession of weakness.

Our view, then, is that the coke market can be developed quickly and satisfactorily by the installation of special grates, while at the same time the Gas Industry should not cease its efforts to produce a fuel which can be burned satisfactorily in the ordinary firegrate. At the Institution Meeting Mr. Belton, of Christchurch, New Zealand, questioned whether new grates are essential if gas coke is to be used. He is marketing a coke containing 3½% of volatile matter and about 9% of ash. It is sized correctly, and he finds no difficulty in burning it in the majority of open firegrates. He believes that ordinary coke advertising is wilfully inadequate and futile. His idea of promoting coke sales—and the results of this idea speak for themselves—is to distribute sample bags of coke free to consumers. Being worried about the coke sales in the winter of 1931, he sent on to the district 17,500 coke samples. In that year he sold 5,850 tons of coke. In 1932 the sales jumped to 7,000, the 1933 figure was 10,300, and in 1934 he sold 12,400 tons. We shall be interested in the 1935 figures. All this increase, of which 85% was in respect of coke used in the domestic grate, involved the sale of only 50 special coke fires. At the same time we wonder whether the satisfaction of the Christchurch consumers would not have been still greater if they had burned this good coke in special grates.

More Co-Operation Needed

CERTAIN it is that much more could be done if there were greater co-operation throughout the country in the matter of coke sales. The story of the London and Counties Coke Association indicates this well enough. In a period of only three or four years practically the whole of the coke produced in 14 counties, and this represents 43% of the total gas coke produced in the country, has been sold by the Association. We have previously mooted the idea of a National Coke Organization, and Mr. Boon's reference to this question of policy and his agreement with our views interests us very much indeed. A Central Coke Organization, he says, would have definite advantages, first, in stabilizing prices; and, secondly, in permitting the distribution of the fuel in a more rational way. Co-ordination would not only be beneficial in meeting adequately the demands of the markets which are available, but also in creating further markets in the starved areas which have not even been examined. The balancing of fuel stocks against peak demands would also become rationalized to the advantage of both the producer and the distributive trade. A central organization would probably have as a primary policy the popularizing of coke as well as the development of new markets. There are certainly many arguments in favour of the Industry pooling its resources and putting its product on a more stable basis than has hitherto been attempted. The conditions of markets and the competition which coke has to meet from other fuels vary so radically in different parts of the country that it would seem necessary to institute regional associations to operate in the same way as the London and Counties Coke Association, and then to co-ordinate the work of all such bodies in one centre. The experience of the London and Counties Coke Association undoubtedly points to the great possibilities of such a plan, and we hope that it will be put into operation.

Dr. Foxwell maintains that a proper sales effort to displace the 40 million tons of coal now used for domestic heating can only be secured by united effort between all coke producers—which means that the coke oven people and the Gas Industry should market their coke through a central organization. His point is that the market is large enough for everybody and that the present competition between oven coke and the coke produced by gas undertakings is good for neither interests. Such co-operation should bring about an expansion of markets on both sides, but expansion in legitimate channels as best suited to the product. In this connection Mr. Boon observes in his reply: "Research into the value of coke fuel, its application to the various markets, would be more carefully studied and allocated. The consumer would consequently have a better product for his particular need, and not a product which is haphazard, frequently at the choice of the distributor." The benefits of such co-operation would be more considerable to the oven coke producers than they would be to the Gas Industry, but we do think there ought to be a better understanding between the coke oven interests and the Gas Industry on the sale of gas as well as of coke; and we say this while appreciating the different viewpoints of the two industries.

Utilization of Breeze

WE have confined our attention to the marketing of coke, but a large part of both Mr. Boon's Paper and the discussion was concerned with preparation and handling, and a mass of technical points were raised. These will be considered, we know, with profit, but one question particularly interests us, and that is the utilization of breeze. This matter was dealt with by Dr. Foxwell. His idea is that heated screens should be developed to remove the dust coke below, say, ⅛ in. "This coke," remarks Dr. Foxwell, "is of no use in producers, whether mechanical or otherwise, and cannot be of great use in a boiler. If this coke, which seems to comprise perhaps 15% of the total coke made when all the coke is cut, were scientifically re-mixed with the coal before coking, the quality of most cokes would be improved, the rate of carbonization would be materially increased, and the small coke would be up-graded in price from a very small figure, which for courtesy may be put at 5s. per ton, to the price secured for the best large coke, say, 20s. or 30s. In addition, the removal of this fine material would allow practically all the breeze to be burned in the producers, with immense financial advantage which only those who have calculated the result will fully appreciate." Work by many investigators over a long period has indicated the importance of the possibilities of blending, and the whole question of blending requires more elucidation. We appreciate that the problem is receiving attention in several quarters, and we are looking forward to the publication of investigations such as those which are being undertaken at the Beckton and Southall Works of the Gas Light and Coke Company. Dr. Foxwell does not mention the cost of blending or the influence of the ash content of the dust coke, both of which considerations are important. In the "JOURNAL" for Feb. 15, 1933, Mr. Hollings discussed the carbonization of screened, mixed, and blended

coals. He pointed out that it is doubtful whether coke breeze can be mixed profitably with coal unless the blend is crushed below about ¼ in., and mentioned that several attempts to mix coke breeze with gas coal have failed because after a short experience it has been found that the quality of the large coke was adversely affected. There is, however, a wide financial margin between the price of coke breeze and large coke, and an economic analysis of the results obtained at Beckton and Southall will be of the greatest value to the Gas Industry, for blending, besides its effect on the quality of the coke produced, can have such a marked influence on the whole economics of gas manufacture.

"Field's Analysis," 1934

THE sixty-sixth edition of "Field's Analysis" has now been published, and a review covering some of the principal features of the work is given on later pages. Mr. H. E. Ibbs is, we are happy to note, still the compiler, under the title, however, of Consultant Accountant to the Gas Light and Coke Company, instead of the Chief Accountant. We believe that this is the twentieth issue under his name, and we would like to congratulate him on having, with the aid of his most efficient staff, successfully carried out such a long sequence of this valuable and interesting Analysis.

PERSONAL

Presentation to Mr. Valon Bennett.

Mr. C. Valon Bennett, Engineer, General Manager, and Secretary of the Rochester, Chatham, and Gillingham Gas Company, recently completed a very successful year as President of The Institution of Gas Engineers, and the Engineers and Secretaries of gas undertakings in the County of Kent, met at dinner on Friday evening, June 21, at the Royal Fountain Hotel, Canterbury, to honour him and present him with a souvenir of the occasion.

Mr. L. J. Langford, Engineer and Manager of the Tunbridge Wells Gas Company, presided over the gathering and all the more important undertakings in Kent, excluding the London area, were represented. Mr. Langford, in calling upon Mr. J. M. Campbell, Engineer and General Manager of the Isle of Thanet Gas Company, to propose the Toast of the evening, said that Mr. Bennett was held in the highest esteem and had won the affection of all gas officials in Kent.

Mr. Campbell said that during a lifelong association with the Gas Industry he could not remember any occasion when a group of gas officials had gathered together to do honour to one of their number. It was another case of Kent pioneering, for which they had reason to be proud. Kent was a fairly large county as far as acreage was concerned, but, as far as he could trace, the County had provided only three Presidents of The Institution of Gas Engineers, including Mr. Bennett, their guest.

Mr. Campbell went on to say that he had known Mr. Bennett for 25 years and he had always brought an air of freshness whenever he had come to see him at the Margate Works. Since those early days they all knew of his career at Rochester, and the Rochester Company was very fortunate to have Mr. Bennett as Engineer, particularly during the war. He controlled his Works with foresight and skill during that anxious period and never failed to meet the demands placed upon the Undertaking. The Rochester Company was now an immense concern and was the biggest in Kent. It was his privilege to ask Mr. Bennett to accept a silver cigarette case as a token of esteem and affection from the Gas Officials in Kent. They congratulated him upon the high position to which he was elected, most deservedly, twelve months ago, and they tendered their best thanks for the way he had carried out his duties and upheld the dignity of the position. They hoped that he and his wife would be granted health and strength for many years.

Mr. Valon Bennett, in his reply, said that he had been in Kent for 36 years. The first thing he remembered about a gas-works was, as a boy of eight, when living in Somerset, being hoisted on the shoulders of his father with a piece of coal in his hand. When he had thrown the coal into a retort, his father said, "Now you have done your first piece of work on a gas-works." He had made numerous friends during his Presidency and would not be afraid to say in the face of all of them that he had never known better men than in Kent. He thanked all those present for the very handsome cigarette case they had given him, and, if he had done anything in the Gas Industry to merit their approval, he was more than repaid. He could, however, never repay the kindness shown to him that evening, and, more especially, for the thought which prompted the holding of that evening's function. "No one," Mr. Bennett said, "could adequately fill the Chair of the Institution without the help of his wife, and my wife has been a tower of strength to me."

* * *

The many friends of Mr. A. G. BIRD, London Manager of West's Gas Improvement Company, will be interested to know that he is progressing very well indeed following an operation for appendicitis which was carried out with only a few hours' notice on June 23.

* * *

We learn that Mr. D. D. BURNS, Principal Clerk and Chief Assistant to the Accountant of the Glasgow Water Department, has been appointed Secretary and Treasurer to the Glasgow Gas Department.

* * *

Mr. ARCHIBALD BESLEY PASMORE has been elected a Director of the South Metropolitan Gas Company in the place of the late Mr. F. McLeod.

* * *

Mr. DAVID CRAWFORD, a member of the Dundee Gas Department Engineer's staff, has passed the final examination for the Diploma of Commerce.

* * *

As a result of the final examination of the Institution of Heating and Ventilating Engineers, Mr. A. E. ALEXANDER, M.Inst.F., and Mr. FRED BELL, B.Sc., Assoc.M.Inst.Gas E., members of the Industrial Department Staff of the Liverpool Gas Company, have been elected Associate Members of that Institution.

* * *

On the retirement of the former Secretary of the Institution of Heating and Ventilating Engineers, Mr. H. B. WATT, the Council have appointed Mr. C. C. FERGUSON as his successor.

Obituary

We regret to have to report the death of Mrs. JAMIESON, widow of Malcolm Jamieson, formerly Gas Manager at Thornliebank, and mother of Mr. Jas. Jamieson, Gas Manager, Edinburgh, and Mr. A. Jamieson, Gas Manager, Johnstone.

* * *

The death occurred on June 26 of Mr. CHARLES GOODHUGH DAWSON, until recently Engineer and General Manager of the Torquay and Paignton Gas Company. Mr. Dawson began his career at Sherborne Gas-Works, and left not many years later for Santiago-de-Chile, remaining there until he was appointed Engineer and Manager of Paignton Gas Company in 1896, and on the retirement of the Secretary in 1921, he undertook the duties of that office in addition. When the Paignton undertaking amalgamated with that of Torquay in 1923, Mr. Dawson was made Engineer and General Manager of the joint enterprise, and he held that post for eleven years until May, 1934, when he retired. Mr. Dawson was Chairman of the Western Section of the Southern Association of Gas Engineers and Managers in 1926.

Women's Gas Council

The Chairman and the Secretary

The first Chairman of the Women's Gas Council is Miss Mary Wolseley Lewis, B.A. Educated at Cheltenham Ladies' College, Miss Lewis has been Head Mistress of Francis Holland School, London, and was the founder and first Head of the North Foreland School for Girls. From that position she resigned in order to be able to devote more time to social service of which she had already some experience in connection with women's settlements in Bethnal Green and Fulham and as a member of the Council of St. Pancras housing.

The Chairman.

Miss M. Wolseley Lewis, B.A.

The Organizing Secretary.

Miss K. M. Halpin.

She is Convener of the Education Committee and a member of the Executive of the National Council of Women, a member of the Executive and Advisory Committees of the Women's Employment Federation and Chairman of its Loan Fund, in addition to being Governor of three girls' and one boys' school. Miss Lewis has been round the world and has travelled widely in Europe, studying social conditions in the different countries visited.

Miss Kathleen M. Halpin is the Organizing Secretary of the Women's Gas Council. After a very wide secretarial experience which included journalism and the management of a large estate in the country, a town house, and a city office, she became Private Secretary to Sir John and Lady Simon. Here in addition to the private and social work entailed, she became familiar with many branches of Foreign Office and general Parliamentary work. As an officer in the British Red Cross, V.A.D., a Divisional Commissioner and Camp Adviser of the Girl Guides, Hon. Secretary of the Junior Council of the London and National Society for Women's Service, and an active worker for the League of Nations Union she has increased a wide experience in many branches of women's activities.

Institution of Gas Engineers

The Institution of Gas Engineers was represented at the 76th Annual Meeting of the German Association of Gas and Water Engineers in Königsberg from June 17 to 19, 1935, by the Technical Assistant Secretary, Dr. W. T. K. Braunholtz, when the opportunity was taken of investigating the experimental process for rendering gas non-poisonous.

The Institution will be represented at the Annual Conference of the Belgian Gas Association in Brussels on July 4, 5, and 6, 1935, by the President, Colonel W. M. Carr, and the Secretary, Mr. J. R. W. Alexander. The programme of the Conference includes a visit to the International Exhibition in Brussels, at which the "Gas Palace" will be inspected.

1935 "JOURNAL" DIRECTORY

Page 78. ARMADALE. W. M'Kinlay appointed S. vice N. M'Leod resigned.

Page 80. BIGGAR. G. Carr appointed M.

Correspondence

Allies of Coal

SIR,—I beg to refer to the last paragraph of the editorial headed "Coal Industry Moves" in your issue of June 26, which states that "the affairs of the coal industry could never be placed upon an entirely satisfactory basis until that industry comes to regard gas and electricity as its allies rather than its competitors."

With these sentiments I personally am in complete agreement, and I can remember at least three occasions when I was a member of deputations from Associated Collieries which were charged with the object of exploring the identical avenue which you yourself, Sir, and, in the issue of a previous week, the President-Elect of The Institution of Gas Engineers indicate.

In those days our missions were not successful, but, speaking for myself and without any mandate, I think I may say that, with the slightest official indication that the entrance to these avenues, which in the past has been closed, is now open, as would seem to be indicated by your report, then those who formed the unsuccessful deputations of the past would, I believe, be willing to repeat their efforts at that co-operation. I agree with you and Colonel Carr that such co-operation is eminently in the interest not only of the coal industry in particular, but of the Nation in general.

Yours, &c.,
A. J. GAINSFORD.

Belle Vue,
Sheffield, 2,
July 1, 1935.

Annual Conference of the Advertising Association

On June 25, Sir Francis Goodenough, as President of the Incorporated Society of British Advertisers, took the chair at the "Direct Advertising" Session of the Eleventh Annual Conference of the Advertising Association, which was held at Torquay.

Sir Francis also attended the Mayoral Reception on June 24, and the Annual Banquet on the following day, the latter being presided over by Sir John Pybus, Bart. (who was a member of the Committee on Education for Salesmanship of which Sir Francis was Chairman, 1928-31).

The Conference, which was very successful, was also attended by Mr. A. P. Ryan, Publicity Officer of the Gas Light and Coke Company.

Forthcoming Engagements

July.

5.—MANCHESTER DISTRICT ASSOCIATION.—Meeting at Cleckheaton.
5.—SOUTHERN ASSOCIATION (EASTERN DISTRICT).—County Meeting at Brighton.
6.—WESTERN JUNIOR ASSOCIATION.—Summer Meeting at Weymouth.
8.—I.G.E.—Finance Sub-Committee, 1.45 p.m.; Membership Sub-Committee, 2.30 p.m.; General Purposes Committee, 3.15 p.m.; Benevolent Fund Committee of Management, 4.30 p.m.
9.—I.G.E.—Council, 10 a.m.; Sir Arthur Duckham Memorial Fund Executive Committee, 4 p.m.
9.—N.G.C.—Meeting of Central Executive Board, 2.30 p.m.
9.—FEDERATION OF GAS EMPLOYERS.—Meeting of Central Committee, 12 noon.
10.—B.G.F.—Council Meeting, 10.30 a.m.
10.—BRITISH GAS FEDERATION.—Meeting of Exhibitions Committee, 28, Grosvenor Gardens, S.W. 1, 2.30 p.m.
17.—B.C.G.A.—Executive Committee Meeting, 11 a.m.; General Committee, 2.30 p.m.
18.—S.B.G.I.—Council Meeting at 56, Victoria Street, S.W. 1, 2.30 p.m.
26.—I.G.E.—Liquor Effluents and Ammonia Committee, 11 a.m.; Joint Research Committee, 2.30 p.m.
30.—I.G.E.—Joint Lighting Committee, 2.30 p.m.

Sept.

12.—NORTH BRITISH ASSOCIATION.—Annual Meeting at St. Andrews.

News in Brief

A Visit to Cleckheaton, the President's Works, will be paid by the Manchester District Association of Gas Engineers on Friday, July 5.

The Annual Outing of the Distribution Staff of Accrington District Gas Board was held recently when 25 members visited Liverpool, New Brighton, and Southport.

An Offer to Floodlight the Cenotaph at Oak Hill Park by the Accrington District Gas Board each Armistice Day has been accepted by the Accrington Corporation.

Mr. Cecil H. Bamber, Rochdale's Engineer and Manager, addressed the members of the Rochdale Rotary Club on Thursday, June 20, on "Coal Gas and the Gas Industry."

A Ministry of Health Enquiry was held on July 2 into the application by the Salford Corporation to borrow £89,000 for the extension and modernizing of the Gas Undertaking.

Application to the Board of Trade is intended to be made by the British Gas Light Company, Ltd., with the object *inter alia* of acquiring the Undertaking of the Ruthin Gas Company.

An Extension of Limits of Supply is one of the objects of a Special Order under the Gas Undertakings Acts, 1920 to 1934, for which the Tyldesley Urban District Council intend to apply to the Board of Trade.

An Increase of 5·6% in the output of gas over the corresponding month of last year was reported by Mr. F. Blackburn, Engineer and General Manager to the Plymouth Corporation Gas Committee on Thursday, June 27.

The Three-Lift Spirally-Guided Gasholder at Saltcoats Gas Company's Works is now in use. The holder has a capacity of 130,000 cu.ft., against 48,000 cu.ft. of the former holder. The contractors who carried out the work were Messrs. Robert Dempster & Son, Elland.

Declaration of Calorific Value.—The Goole Gas Department gives notice that, pursuant to the Gas Undertakings Acts, 1920 to 1934, and the Goole Gas (Charges) Order, 1929, they intend to supply gas of a declared calorific value of 460 B.Th.U. on and after Oct. 1, 1935.

The Price of Gas in Galashiels has been reduced by 1d. per 1,000 cu.ft., making the price to ordinary consumers 2s. 11d. per 1,000 cu.ft., less 15% discount to engine power and trade consumers, and to consumers by prepayment meters, including rent of meter, 3s. 4d. per 1,000 cu.ft.

Mr. W. R. Oliver, the B.C.G.A. Display Officer, is going to Brussels on Friday, July 5, to study continental methods of window display at the Exhibition there. On Saturday he will be the guest of the Association des Gaziers Belges, whose Annual Conference takes place from July 4 to 6.

The Annual Summer Conference of the Industrial Copartnership Association will be held at Selwyn College, Cambridge, during the week-end of July 5 to 8. Among those who will take part in the Conference are the Rt. Hon. Viscount Cecil of Chelwood, the Rt. Hon. George N. Barnes, C.H., Professor Ernest Barker, the Master of Selwyn, Mr. A. M. Wall, Mr. E. J. Fox, and Mr. T. G. Rose.

If the Recommendations of the Stockport Corporation Gas Committee are adopted, the Town Council will purchase the Poynton Gas Undertaking under powers given them by a Corporation Act of 1934. Poynton gas-works are owned by Poynton Collieries Company, Ltd., and would be closed if the recommendations are accepted. The district would then be supplied from the Stockport Corporation mains.

"**Sands, Clays, and Minerals.**"—We have received from Mr. A. L. Curtis the current issue of this informative work, which consists of 160 pages, with 72 illustrations, and contains interesting articles on Radium Discoveries in North West Canada; Uses of Zirconium; Silicosis in Industry; Firebrick; Lead and Tin Mining; Magnesite Bricks; Briquetting of Small Coal; Tasmania's Mineral Resources; Manganese Steel; &c.

Further Price Reductions.—The Directors of Aberfeldy Gas Light Company, Ltd., have resolved to reduce the price of gas by 5d., thus bringing it down to 5s. 5d. At a meeting of the Johnstone Town Council Gas Committee it was agreed to approve of the Sub-Committee's recommendations that a reduction of 2·1d. per 1,000 cu.ft., or ½d. per therm be made on all gas used by prepayment meter consumers after the October survey.

The Eighth Plenary Meeting of the International Conference of Benzole Producers was held in Rome on June 24, 1935, under the Chairmanship of His Excellency Nicola Parravano. The Members of the Conference are the Producers of Benzole of Europe and Australia. Herr Direktor Doctor Hasslacher, of Germany, was elected President to succeed Sir David Milne-Watson, of England, who has completed his three years' term of office. The Past-President (Monsieur Laurain, of France) and Sir David Milne-Watson were appointed Hon. Presidents. The Conference dealt with technical and economic questions in connection with benzole.

Siegen's Spherical Gasholder.—We understand that a spherical gasholder has recently been completed at Siegen, Westphalia. The holder has an inside diameter of 51½ ft. and a capacity of 70,632 cu.ft. of water. It has been designed to withstand a pressure of 5 atmospheres so that the gas storage capacity amounts to 353,160 cu.ft. The holder is constructed of steel plates 14½ mm. thick, joined together by double rows of rivets; altogether 48 plates measuring approximately 10 ft. by 20 ft. were used in the construction, the total weight of which is 127 tons. The holder is mounted at about its horizontal centre line on a series of triangulated tubular supports which are pivoted to the base plates to allow for any deformation due to varying temperature conditions.

Degrees at Leeds University

The following results have been declared of the Final Degree Examinations in Gas Engineering at the University of Leeds:

Doctor of Science.—R. A. Mott, M.Sc.

Doctor of Philosophy.—H. C. Millett, B.Sc. (Institution Gas Research Fellow), for a thesis entitled "The Scaling of Mild Steel in Sulphur-free and Sulphur-containing Furnace Atmospheres."

Bachelor of Science.

1st Class Honours.

J. E. Cullingworth, B.Sc., for a thesis entitled "The Carbonization of Cellulose."

H. Millner, B.Sc., for a thesis entitled "Some Properties at Various Temperatures of Refractory Materials in Torsion, with Special Reference to Kaolin and the Determination of its Ultimate Shear Strength." This candidate was also awarded the Le Blanc Medal for distinction in the Honours School of Applied Chemistry.

2nd Class Honours.

D. G. Woolfenden, B.Sc., for a thesis entitled "The Influence of Partial Gasification of Coke upon its Behaviour in the Open Grate, with Particular Reference to the Bulk Density."

Ordinary.

A. A. Clark, K. Bolton, J. H. Bramley, G. C. N. Coates, J. E. Cooper, A. Lister, H. Q. Marris, R. G. Parker. (This candidate, who holds the Cartwright Holmes Scholarship, has to attend another year before graduation, but has passed the examination. He will take the Honours Course next year.)

Dr. R. A. Mott is Research Assistant in the Department of Fuel Technology, University of Sheffield, and Secretary of the Midland Coke Research Committee. He entered the University of Leeds in 1916 with the William Walker Scholarship, graduated B.Sc. with 1st Class Honours in 1922, and M.Sc., 1922.

Mr. H. Millner is the son of Mr. F. Millner, Distribution Superintendent of the Scarborough Gas Company, and is now employed with that Company.

Mr. D. G. Woolfenden has recently entered the service of Messrs. Foster & Pullen, Ltd., of Bradford.

Mr. K. Bolton is the son of Mr. W. Bolton, Engineer and Manager of the Raunds Gas Light and Coke Company.

Mr. J. E. Cooper was a pupil of Mr. T. W. Barratt, Engineer and Manager to the Morecambe Gas Department, and later Technical Assistant to the Cleethorpes Gas Company.

Mr. R. G. Parker was formerly a Technical Assistant to the Plymouth and Stonehouse Gas Company.

Amalgamation and Grouping

Caledonian Gas Corporation and Leslie.

The Directors of Leslie (Fife) Gas Company, states a local correspondent, have accepted an offer by the Caledonian Gas Corporation, Ltd., to acquire the Undertaking, and the shareholders are recommended to agree to the transfer. It is understood that the price offered is £2 8s. in cash for each of the £1 ordinary shares.

Interchangeable Displays

New B.C.G.A. Scheme

A system of interchange of displays by which members will receive a regular supply of display material for a nominal yearly fee has been evolved by the B.C.G.A. studio. Mr. W. R. Oliver, the Association's Display Officer, gives the following explanation of the scheme.

There will be supplied to members a first-class window display every fourteen days, four 20 in. by 30 in. showroom posters per month, including one message frame, four thin or lorry posters—20 in. by 30 in.—per month and six 18 in. by 12 in. showcards three times a year, in the spring, autumn, and winter. The window displays will be constructed, in the main, in three sections that can be used individually or as a whole, thereby allowing for large or small windows. The displays will be so designed that they will be topical and seasonable at all times of the year. The posters and showcards will generally link up with the theme embodied in the national advertising issued by the B.C.G.A.

The displays will be interchangeable, but the posters, frame, and showcards will be the property of the undertaking.

Every fortnight members will receive a label for the forwarding of the display to the next undertaking on the rota, and they will, in turn, receive a replacement display from another member. At the end of twelve months each member will have received twenty-six different displays, and 96 posters, together with a message frame and 18 showcards. The actual cash value will be about £200; but the annual inclusive fee to members will be only £20.

Scottish Junior Gas Association (Eastern District)

Annual Outing to Dunfermline

Through the kindness of Mr. J. Campbell (Engineer and Manager of the Dunfermline Gas Department), the Annual Outing of the Scottish Junior Gas Association (Eastern District) was held at Dunfermline on Saturday, June 8, when about 50 members and their ladies spent a very enjoyable day.

The ladies, under the guidance of Mrs. Campbell, visited the linen and embroidery works of Messrs. Hay & Robertson, where they were shown the process of manufacture of various materials and a showroom of finished articles for which Dunfermline has become famous.

The members of the Association meanwhile visited the gas-works, where particular interest was shown in some recently installed plant, which includes new 20 tons per hour C.C.L. coke screens with conveyors and storage hoppers. A new concentrated liquor plant by Balfour's, of Leven, to handle 25 tons of crude liquor per hour was in course of erection and will be used in place of the sulphate of ammonia plant which has been dismantled. High-pressure gas is used to supply a number of outlying districts and villages, and a new Bryan-Donkin vertical two-cylinder steam driven compressor of 75,000 cu.ft. per hour has been installed to augment the existing horizontal compressor.

The parties met again at the Royal Hotel for lunch, after which there was the option of taking part in a Golf Competition or a motor tour of local beauty spots.

The Golf Match was played over the Pitreavie Course and resulted in Mr. Thomas F. Scott (Leslie) winning the Handicap Section with a score of 91 (less 16), 75. Mr. Lewis Bain, Jnr. (Leven), and Mr. J. A. Anderson (Edinburgh) tied for scratch prize with scores of 86.

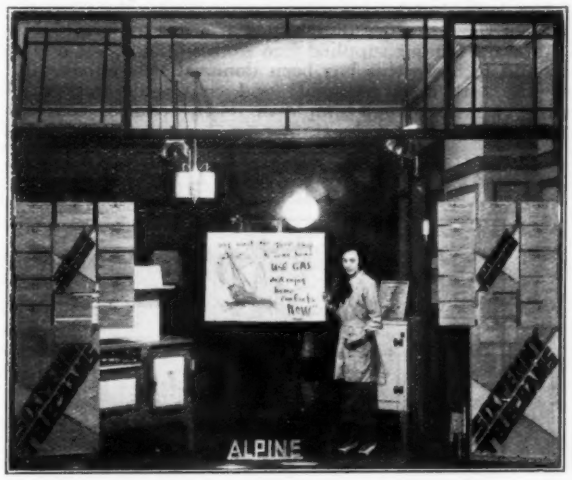
The tour took the party through Rumbling Bridge and Crook of Devon to Scotlandwell, where the waters of this ancient well were taken. Loch Leven, famous for its fishing and historic connections, was circled, returning to Dunfermline by the coal districts around Kelty.

By invitation of the Corporation, tea was served in the New Victoria Restaurant, when Mr. A. J. Doran (Edinburgh) expressed regret that their President (Mr. Sydney Smith, now of Bristol) had not been able to be with them. He assured the members of Mr. Smith's continued interest and informed them that it was due to Mr. Smith's generosity that the motor tour had been made possible. They also owed a debt of gratitude to Mr. Campbell who had arranged the programme and to his wife for acting as their hosts throughout the day. He asked Mr. Campbell to convey their thanks to the Corporation for their kindness and hospitality.

After tea, the evening was spent sight-seeing in Pittencrieff Glen which has been largely endowed by the late Andrew Carnegie.

A Topical Display in Guernsey

In connection with some recent cookery demonstrations held by the Guernsey Gas Light Company in co-operation with the Davis Gas Stove Company, a topical window display was arranged which created considerable interest. As will be seen from our illustration, a link-up was effected with the newly introduced sixpenny telegram rates, this being particularly appropriate as the gas showrooms are immediately opposite the post office.



The telegrams seen in the window were actually *bona fide* messages sent to the Company, at the request of one of their canvassers, by satisfied users of "Alpine" gas cookers.

The cookery lectures were given by Miss Sanderson (of the Davis Gas Stove Company), while the B.C.G.A. artists seen in the photograph attracted considerable attention in the window during the period of the demonstrations.

New System of Charges at Bolton

We are indebted to Mr. W. J. Smith, B.Sc., Engineer and Manager, Bolton Corporation Gas Department, for the following details of the system of charges confirmed by the Town Council on June 5:

For all gas consumed up to the quarterly consumptions as per scale below the charge to be 9·6d. per therm (equivalent to 3s. 7·2d. per 1,000 cu.ft.). A further equal quantity of gas consumed will be charged at 6·67d. per therm (equivalent to 2s. 6d. per 1,000 cu.ft.). All additional gas consumed to be charged at the rate of 4d. per therm net (1s. 6d. per 1,000 cu.ft.). On all gas which is charged for at the rates of 9·6d. and 6·67d. per therm, a discount of 5% will be allowed for payment within 21 days.

Size of House.	Fixed Quarterly Consumptions.			
	June and September Quarters.		December and March Quarters.	
	Therms.	Equivalent in Cu.Ft.	Therms.	Equivalent in Cu.Ft.
4 Rooms and under .	9·00	2,000	18·00	4,000
5–6 Rooms	18·00	4,000	27·00	6,000
7 Rooms and over .	22·50	5,000	31·50	7,000

In addition to the rebate at present allowed a further rebate of one penny per 100 cu.ft. will be allowed on all gas

consumed through a prepayment meter which would be charged for if consumed through an ordinary meter at the rate of 1s. 6d. per 1,000 cu.ft. under the above-mentioned scale. The proposed new system of charges will come into operation as from the meter readings for the September quarter's consumption.

Petrol from Coal

The National Coke and Oil Company, Ltd., announce that the gas producer plant for heating their retorts at Tipton has been lighted. The first retort will come into operation as soon as the necessary preliminary drying and heating have been completed. Three other retorts will follow at intervals of approximately three weeks. The Tipton plant will have a daily throughput capacity of 300 tons (150 tons of coal and 150 tons of oil obtained in the process) and will supply the Birmingham district daily with approximately 120 tons of smokeless fuel and 2,250 gallons of motor spirit of high octane rating.

The National Coke and Oil Company having a large area of land available at the Tipton site, have built model dwellings for their workmen, and the first houses will be ready for occupation next month.

A similar plant is being erected on the Thames at Erith, and this plant should come into operation about two months after the Tipton plant. From the Erith plant, a similar quantity of smokeless fuel and motor spirit will be available for the London market.

Owing to the large amount of motor spirit obtained under the process as operated by the Company the smokeless fuel should, they state, be available to the public at the same price as first-class household coal.

The "Walton" Automatic Alarm

In manufacturing processes it is often required to maintain a quality of product up to some desired standard of value or degree of purity without the necessity for continuous personal supervision, as is the case where a regular and frequent routine of tests is the only method of attaining the desired end.

One of the statutory obligations of a gas undertaking is to maintain the gas supplied free from sulphuretted hydrogen, and hitherto this has been done, almost universally, only by a regular, frequent, and continuous system of testing, which, though simple in itself, requires constant attention from the works staff.

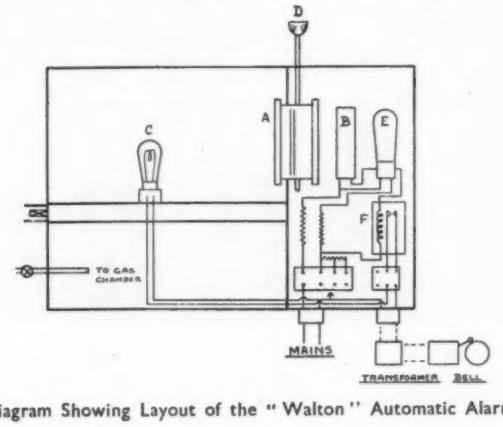


Diagram Showing Layout of the "Walton" Automatic Alarm.

The "Walton" automatic alarm has been developed by Messrs. Alexander Wright & Co., Ltd., to give an alarm signal as soon as the gas contains the slightest trace of sulphuretted hydrogen, thus enabling the necessary steps to be taken with a minimum of delay. As will be seen from the accompanying diagram, the alarm consists essentially of a gas chamber A, with removable front, through which the sample to be tested passes continuously. This chamber has glass windows at front and back. The gas passes to a burner D which governs the flow to approximately 5 cu.ft. per hour. In this gas chamber is placed, on short hooks, one or more specially prepared papers of a suitable thickness and texture.

On one side of the chamber and enclosed in a section of the case is a lamp C, usually electric, which is mounted so as to be adjustable in distance from the gas chamber by means of an external fitting. On the opposite side of the chamber is a photo-electric cell B and amplifier E with a suitable relay F. This part of the apparatus is assembled on a swinging door for accessibility.

In action, light from the lamp passes through the gas chamber and the prepared papers and excites the photo cell, and the circuit is so arranged that no current passes from the amplifier. When, however, the light is obstructed, as it is when the papers become stained due to the passage of impure gas, the photo cell operates the amplifier and current flows to the relay and so enables some form of alarm to be operated. Usually, this consists of an electric bell which is most conveniently worked from the mains through a small transformer.

In use, the instrument is connected to the electric supply by means of the external socket and plug provided, and the alarm bell and transformer connected to the plug and socket marked "Alarm," and the internal connection to terminal block made to the appropriate terminals for the voltage available.

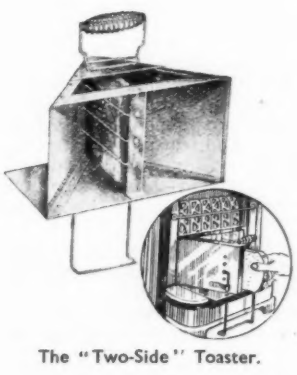
As soon as impure gas is passing—even a minute trace sufficient to discolour the paper to a light straw colour—the alarm will operate. At any time when the papers have become discoloured due to impure gas the papers should be replaced with fresh ones, making sure first that the service has been cleared of any residue of impure gas.

The papers may remain indefinitely, but it is preferable to replace at regular intervals of, say, not more than seven days, as owing to the presence of infinitesimal quantities of impurities, or even dust, &c., the papers may become discoloured in time with gas which may be classed as "officially" pure.

Some Useful Accessories

The Gas Industry has not always been too fortunate in its ability to meet the needs of those desirous of giving small gifts at Christmas and other times to their relations and friends—for not all are in a position to make promiscuous presents of gas cookers and fires or water heaters, desirable as such gifts might be. In recent years, however, the appearance of many useful gas "gadgets," at prices to suit all purses, has gone a long way towards the solution of this problem, and has definitely put the gas showroom "on the map" so far as the gift seeker (we might almost say the bargain hunter) is concerned.

There is a considerable appeal in the many useful little gadgets which may be regarded as accessories to the gas appliance. These may be divided into two main classes—namely, those which themselves constitute gas-burning appliances, such as gas kettles, pokers, curling iron heaters, &c., and those which are entirely supplementary to the gas appliance, such as specially designed utensils, dish warmers, toasters, and so on. Many interesting little gadgets of this nature are to be found among recent productions of Messrs. Falk, Stadelmann, & Co., Ltd., which are described and illustrated in their latest catalogue.



The "Two-Side" Toaster.

The "Double" Poker.

One of the most interesting of these is their "Two-Side" toaster, which, as our illustration shows, may be stood in front of any ordinary gas fire and toasts bread on both sides at once by reflected heat. The front of the toaster rests on the fender of the fire, and an adjustable support is provided at the back to suit fenders of varying heights. The overall measurements are 9½ in. wide by 5½ in. deep.

Upon test before a standard vertical radiant gas fire we found that a round of bread was efficiently toasted in about 35 seconds, being uniformly browned on both sides, while retaining its moisture inside—a desirable feature of good toast. The gas fire does not require to be turned on too fiercely during the toasting, as this tends not only to toast the bread too quickly and burn the edges at the point nearest the radiant but also to overheat the handle —with somewhat painful results when the appliance is picked up to slide out the toast. In normal circumstances, however, the handle remains reasonably cool considering its proximity to the source of heat.

The other appliance illustrated is the firm's " Double " gas poker, which is particularly useful for igniting large coke fires. The double blades ensure equal ignition of the fuel on both sides of the grate and thus facilitate lighting up. Another interesting gadget is their " Edna " Toaster, which may be placed over an ordinary gas ring burner and makes four pieces of toast in two minutes. Its patent inner cone ensures full and equal distribution of the heat to all four sides.

Automatic Flue Damper Control

Messrs. James Keith & Blackman Company, Ltd., are now manufacturing under licence from the Gas Light and Coke Company an automatic flue damper for gas-heated industrial appliances, which is considered to be an essential part of a furnace or oven equipment.

With most gas-heated industrial appliances it is found that the openings for the admission of secondary air are much larger than is really necessary, and it is therefore highly desirable to have some form of damper arrangement on the flue which can be readily controlled, preferably automatically.

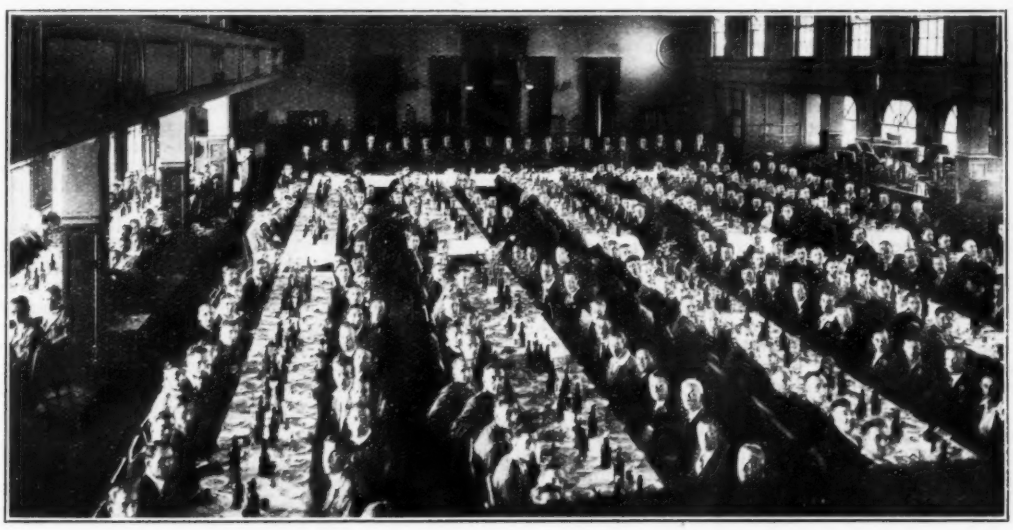
This new and simple form of diaphragm operated flue damper is now offered which will automatically reduce the area of the flue proportionately with the gas rate, and will therefore conduce to higher efficiency. One of the advantages secured is that the flue damper cannot shut while the gas is lighted, and, on the other hand, when the gas is shut off, the damper automatically closes and thus prevents too quick a flow of air through the furnace and up the flue, causing too rapid cooling.

These dampers are made for various flue sizes and can be inserted in the flue at any convenient point. The construction of the unit is simply as follows: The gas pressure at the burner is transmitted to a diaphragm which is linked to a damper plate by two rods. The force exerted by the gas pressure is balanced against a special spring working in compression, and, in order to obtain the correct relationship between the damper opening and the gas rate, the spring is carefully tapered to give the necessary movement proportional to the square root of the gas pressure.

By this means all loss of power through cams is avoided, and the size of the diaphragm (12 in. diam.) is such as to make the operating force great in comparison with any frictional forces which are likely to be encountered. The damper plate has a movement of 45° only, so that the flue opening is approximately proportional to the angular displacement. Two adjustments are provided, one to alter the rate of angular movement for a given diaphragm movement and the other to alter the zero position of the damper plate.

The standard finish is dull chromium plate, the damper plate being of staybrite steel to prevent corrosion. All moving parts are enclosed.

William Sugg & Co.'s Jubilee Year Staff Outing



A Section of the Luncheon Party at the Savoy Café, Southsea.

On June 29, the staff of Wm. Sugg & Co., Ltd., were entertained by the Company in celebration of Silver Jubilee Year. A special train conveyed the party to Southsea, where an enjoyable day was spent in glorious weather. Luncheon was served in the great hall of the Savoy Café, the chair being taken by Mr. Philip H. Sugg (Chairman of the Company), supported by Mr. William Mattock (Joint Managing Director) and Mr. Anthony H. Sugg (Director and Secretary). In giving the loyal toast the Chairman referred to the wonderful example of devotion to duty provided by H.M. the King during this strenuous Jubilee Year, and it was honoured with great enthusiasm. The microphone was then passed to Mr. E. Burrage, chief of the plating shop and the oldest serving employee of the firm, with an unbroken record of 48 years, who very ably gave the toast of " The Prosperity of William Sugg & Co., Ltd.," and thanked the firm on behalf of all the employees for the wonderful day they were spending.

Mr. Philip H. Sugg, replying to the toast, expressed the wish that all would have a very happy day and one on which they would be able to look back with nothing but happy memories; he referred with particular pleasure to the fact that several veterans of the firm were with them, the oldest of them, W. Davis, 76, having served 61 years before retiring two years ago, while E. Gerrard, 72, had joined the firm at 14 and served 52½ years. He regretted that W. Lugsden, now 89, who had also joined them at 14 and served 60 years, was not able to be with them although he was still enjoying good health. Mr. Sugg said the Directors were happy in the knowledge that the non-contributory Pension Fund which they had inaugurated in 1923 was enabling them to provide reasonable comfort for their old servants.

Mr. F. W. Casford then gave the toast of " Our Chairman," which was received with great enthusiasm and accorded musical honours, and this was followed by a demand for a speech from Mr. Mattock, who thanked the staff for their co-operation and reminded them that it was very largely due to their good workmanship that the firm stood in the pre-eminent position it occupied to-day.

An expression of gratitude was accorded to the Stewards by Mr. Anthony Sugg, to which Mr. William Hill replied.

A special steamer then took the party to the Isle of Wight, whence they returned in time for tea at the Savoy Café.

Association of Statutory Inspectors of Gas Meters

The Annual General Meeting of the Association of Statutory Inspectors of Gas Meters was held at the County Hall, Westminster, on June 19, under the Presidency of Alderman W. O. WILLS, of Exeter.

The Chairman of the Executive Council (Mr. A. WINTERBOTTOM, Manchester) invested the President with a jewel of office.

The PRESIDENT said he was proud to be the first President to have the privilege of wearing the new badge, and he trusted that when the time came to pass it on, his successor would experience the pleasure in receiving it that he then felt. It was now his duty and privilege on behalf of the Association, to invite three past-Presidents to accept jewels to mark their period of service in the past. He referred to:

Sir Cornelius Chambers, J.P., Birmingham.
Mr. H. N. Barrow, J.P., Manchester.
Councillor J. W. Willoughby, M.B.E., J.P., Salford.

The President then referred to the work done by the Council during the past year. They also had a good schedule before them in connection with suggested revised legislation. He was sure they would not all agree with the whole of the points raised, but they were there to see how far agreement could be obtained through discussion. He had been invited to attend the Annual Meeting of The Institution of Gas Engineers in his capacity as President of the Association, and regretted very much that previous engagements had prevented him accepting that invitation. He wished to thank the Hon. Secretary for his assistance in keeping him posted on current matters during the year, and concluded by extending a hearty welcome to the representatives of administrative authorities present.

The Hon. Treasurer (J. L. BARRY, L.C.C.) read the statement of accounts, which was adopted. Mr. Barry stated that the membership was being maintained, and that the working balance was satisfactory.

It was resolved that the Annual Report of the Council be taken as read.

The Council's Report.

The Council have held two meetings during the year and have principally been concerned with the preparation of material towards the memorandum in connection with revised legislation.

The matter is still in an embryo stage, and in reporting progress, it is hoped that members will be indulgent rather than critical. There is now a better idea of what is required, and no doubt it will be possible to present a prepared memorandum in the following year.

(1) That the existing legislation should be repealed, and all requirements consolidated in a new Act.

(2) That every county council should be required to establish and maintain a gas meter testing office under the provisions of the Act, provided that in counties where a county borough or the magistrates of a county borough already administer the Act, the county council may enter into an agreement with the administrative authority of such county borough, to undertake the responsibility for providing service over an area for which the county council themselves become the " local authority " under the Act.

(3) That no person shall be eligible for nomination to sit for the Board of Trade examination, until he shall have not less than three years' whole time practical experience of testing gas meters under an administrative authority. That the examination be extended to cover an appropriate type of gas distribution or supply question as set by the City and Guilds of London Institute.

(4) That a Board of Examiners should be appointed to prepare examination tests and conduct the examination. That the composition of such Board should include a member of this Association to represent the practical side of the work.

(5) That an inspector should be authorized to enter to inspect or test gas meters on the premises of private consumers, gas undertakings, meter makers, and repairers in their own district.

(6) That each testing office shall be in charge of a qualified Statutory Inspector of Gas Meters.

(7) That provision be made for the compulsory re-verification of gas meters.

(8) That in the case of wet meters, the terms of dispensation from requiring a float valve shall be 600 cu.ft. per hour and above.

(9) That the word " meter " shall mean " gas meter " and shall include every kind of machine or contrivance used for measuring gas or computing any charges, fees, or account to be made or rendered for the amount of gas used, whether the gas is sold by the gas undertakers or other persons.

(10) That each meter shall be stamped or sealed on the frame enclosing the index glass and covering the seam at the top front of the meter, in addition to any further part of the meter which can be opened for the purpose of adjusting the registering mechanism.

(11) That a gas undertaking on removing for the purpose of testing any meter of which the accuracy is suspected, shall give the consumer notice in writing to that effect before the meter is removed, and furnish the said consumer with the certificate of test or a copy thereof, on or before the account for gas consumed is rendered.

(12) That a gas undertaking on removing a meter with the object of submitting the same for certificate of an official test, shall not test or interfere in any way with the said meter before it is submitted for that official test.

(13) That it should be a requirement to incorporate the following particulars on the index dial plate of the meter:

(*a*) Maker's name.
(*b*) Number of identification.
(*c*) Capacity per hour.
(*d*) Capacity per revolution.

(14) That any person or persons who remove an official stamp, or knowingly cause an official stamp to be removed and affixed to the same or another meter, shall be deemed to counterfeit a stamp and suitable penalties to be imposed upon conviction.

(15) That the Board of Trade shall have power to require a manufacturer of meters, machine, or contrivance used in the sale of gas, to submit a pattern for examination, and that an inspector of gas meters shall have power to refuse to test and stamp such meter until the pattern has been approved by the Board of Trade.

(16) That it should be an offence to fix any stamp excepting the government stamp on the body or index of a gas meter, and that a suitable penalty be imposed upon conviction, such provision not to apply to the prepayment attachment.

(17) That it be required to test every meter separately.

(18) That provision should be made for granting a warrant to an inspector of gas meters in England and Ireland, authorizing him to search premises and seize gas meters, provided he has proved to the satisfaction of two or more justices of the peace or magistrates that he has reasonable grounds for believing that unstamped or unjust meters are in use in certain premises.

(19) That each testing circle be clearly marked by figures or arrow indicating the direction of the pointer.

(20) That if, in the opinion of the inspector, the capacity per hour marked upon the meter is unduly high, he shall submit the meter to a further test under the same conditions, except that the rate per hour shall be equal to 100 revolutions or complete actions of the measuring capacity of the meter, or such other number of revolutions as may be from time to time determined by the Board of Trade in respect of any pattern of meter. Should the meter when so tested not register correctly within the before-defined limits of error, or during either test cause undue oscillation, or give evidence of any mechanical or other defect which could be reasonably and practically prevented in good meters, the meter shall not be stamped.

Discussion.

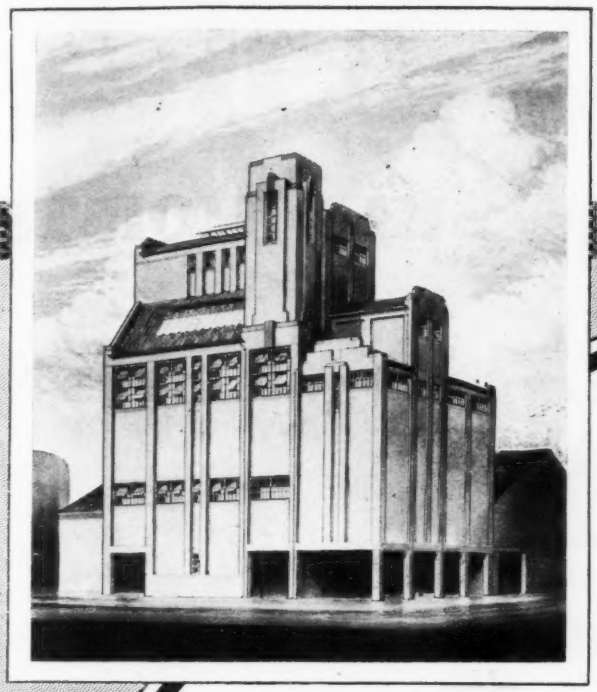
Clause (1).

Mr. WATSON (Sheffield) said he thought it would meet with general approval in so far as it related to statutory provisions; but he would suggest that the Council prepare two memoran-

WOODALL-DUCKHAM

CONTINUOUS & INTERMITTENT

VERTICALS



Design Drawing for the new Installation at Loughborough

INSTALLATIONS IN COURSE OF CONSTRUCTION

	Capacity in Tons per Day
ALGIERS (North Africa)	213
BARI (Italy)	24
BIRMINGHAM (9th Installation; Windsor Street)	591
BRECON	10
CARMARTHEN	15
CHESTER	132
ELGIN (2nd Installation)	12
EPPING	25
ILKESTON	65
LIVERPOOL (3rd Installation)	153
LOUGHBOROUGH	42
ROME (Italy)	304
STOURBRIDGE (3rd Installation)	63
WANDSWORTH (2nd Installation)	200

Modernisation and Reconstruction Work is in progress at:—
NOTTINGHAM, HULL, SMETHWICK, GREENOCK, STOCKPORT, KENDAL, GLOSSOP AND KENSAL GREEN

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Telegrams: "Retortical, Sowest, London" **Telephone: Victoria 8631 (6 lines)**

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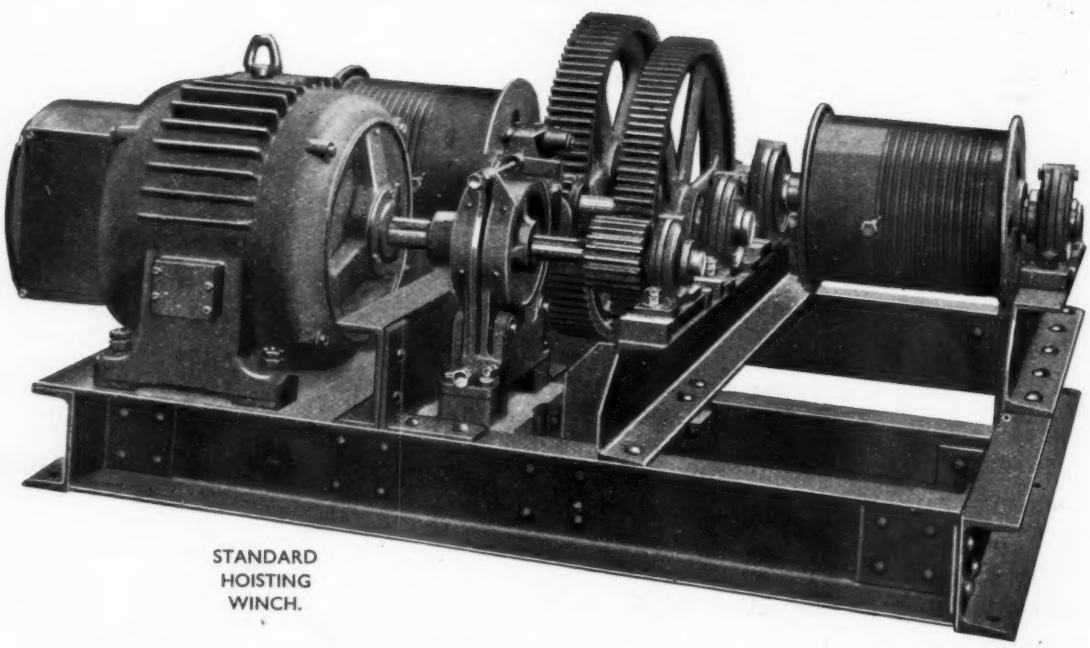

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dums, one dealing with suggested enactments and the other with regulations. The clause was carried without amendment.

Clause (2).

Following a general discussion, after which it was agreed that the words "should be required to" and "may enter" be deleted in favour of obligatory terms, Mr. SLOAN (Coventry) moved and Mr. PLACE (Bradford) seconded, that the clause be referred back for re-drafting.

Clause (3).

Mr. WATSON (Sheffield) said he thought the suggestion would weaken instead of strengthening the position. If a person had three years' practical experience it should not be necessary to submit himself for examination as to his ability to test. He thought the Association should deprecate rather than encourage the testing of gas meters by persons other than duly appointed Inspectors, and suggested that three years whole time employment in a meter testing department under an administrative authority be substituted for "three years' whole time practical experience of testing gas meters."

Mr. CAMPBELL (York) said he had the strongest objection to three years. Mr. ALLEN (Hull) supported by Mr. WILDMAN (Burnley) proposed the deletion of the words "testing gas meters." Mr. HALL (Reading) supported by Councillor WHEELHOUSE (Hull) proposed the period be reduced to two years. Sir CORNELIUS CHAMBERS (Birmingham) and Bailie ALDRIDGE (Edinburgh) spoke in favour of the clause as it stood, and on being put to the vote, it was carried with six dissentients.

Clause (4).

Carried by 19 votes to 16 after general discussion.

Clause (5).

Retained after the question had been put.

Clauses (6) *to* (15).

Agreed.

Clause (16).

Agreed upon the words "stamp of verification" being substituted for "Government Stamp.'

Clause (17).

Agreed upon the words "for registration" being added.

Clause 18.

Mr. WATSON (Sheffield) moved and Mr. HALL (Reading) seconded that the words "United Kingdom and Northern Ireland" be substituted for "England and Ireland." This was carried and the clause adopted.

Clause (19).

Agreed.

Clause (20).

Mr. KNOTT (L.C.C.) moved and Mr. DALTON (Liverpool) seconded that this clause be amended to read "That the Inspector shall submit the meter to a further test under the same conditions, &c." With this deletion the clause was adopted.

Mr. WATSON (Sheffield) moving the adoption of the report, seconded by Mr. LANGLANDS (Glasgow), said he also moved that the Council be thanked for the work they had done. They had still a long way to go, and he thought their labours would be considerably lightened if they would consider certain provisions of the Weights and Measures Acts which he recommended to their notice.

Mr. R. J. TRUMP (Controller of the Standards Dept.) explained that it was desirable for the Association to put forward in the memorandum they proposed to submit every point which their experience suggested, irrespective of whom it may concern. There was no need to be too precise about drafting and the other parties concerned would be quite able to protect their own interests.

Election of Officers.

President.

Alderman W. O. Wills	Exeter

Vice-Presidents.

Sir Cornelius Chambers, Kt., J.P.	Birmingham
H. N. Barrow, Esq., J.P.	Manchester
Councillor J. W. Willoughby, M.B.E., J.P.	Salford
Bailie Aldridge	Edinburgh
J. Farrar, Esq., J.P.	Leeds
Councillor J. Wheelhouse	Hull
H. J. C. Davies, Esq.	Chief Officer, Public Control Dept., L.C.C.

Hon. Secretary.

Wm. Templeton	Leeds

Hon. Treasurer.

J. L. Barry	L.C.C.

Council.

A. Winterbottom	Manchester
Geo. Hume	City of London
Wm. Gordon	Edinburgh
E. M. Foster	Exeter
G. F. J. Knott	L.C.C.
F. Colburn	Birmingham
J. E. Sloan	Coventry

Auditors.

F. A. Rolfe	L.C.C.
E. Simpson	Salford

It was resolved that the next Annual General Meeting be held at Blackpool and that the Council should fix the date and make suitable arrangements.

Tar and Roadmaking

In a Paper read at a Meeting of the International Road Tar Conference in Rome last week, Mr. W. E. Cone, Technical Adviser to the British Road Tar Association, said:

A well-drained, strong foundation is the first essential in modern roadmaking, and where necessary, proper corrective measures should be taken to ensure its stability and permanence. Secondly, the value of careful and comprehensive preliminary studies cannot be overestimated in determining the best type of construction to meet traffic demands. Thirdly, the mineral aggregate should possess sufficient toughness and resistance to abrasion to withstand the impact of traffic. Fourthly, the grading of the aggregate should be controlled very carefully to obtain a mixture of the requisite degree of density consistent with the amount of traffic it will have to support. Fifthly, the selection of tar should be based on securing a quality and viscosity best suited for any particular aggregate, and the amount necessary for any given mixture should be carefully determined. Finally, the temperature of the tar and aggregate should be carefully controlled at the time of mixing. From this it will be evident that there are a number of factors requiring special attention in the manufacture and laying of tarmacadam, and it is clear that there is a reciprocal dependence between them. Thus it is natural to conclude that the most efficient results will only be obtained when the operations are co-ordinated and under proper control.

It is satisfactory to record that there has been of late a marked improvement in the design and structural efficiency of tarmacadam surfacings, which has been largely brought about by the use of higher consistency tar and a more uniform grading of the aggregate. The results of the advancement so far achieved show clearly the increased resistance of properly balanced mixtures of tar and aggregates to deformation under such stresses as are imposed upon the surfacing by heavy traffic conditions. The modern tendency is to produce a more dense mixture by a much smaller proportion of voids than that usually associated with tarmacadam in the past. In this connection, experience has shown the desirability of incorporating with the aggregates suitable quantities of mineral filler. The stability of the mixture increases as the voids in the aggregate decrease, provided the proper amount of tar is used. By varying the size and grading of the aggregate and the viscosity of the tar, it is possible to control the stability of the mixture in relation to whether the roads are designed to carry light, medium, or heavy traffic.

Concurrently with these advances has come the development of semi-hot and hot-process tarmacadam (tar concrete), which has made possible the construction of quick-setting surfacings capable of meeting very heavy traffic demands. The advantages to be derived by laying the mixture in the heated state are principally concerned with the binder and the consolidation of the material. In the first place, it enables a tar of improved physical properties to be used. Secondly, the mixture possesses a higher degree of plasticity at the time of rolling. The design of these mixtures is based on securing a reasonably high degree of stability in the compressed surfacing, which can be effected by different combinations of aggregate and filler. It may be noted here that tar concrete has been tested under a variety of conditions, and has satisfactorily met all the demands that have been made upon it. A particular feature of this type of construction is its good wearing properties, which ensure the minimum amount of maintenance over long periods of time.

In regard to the methods of laying the materials, of outstanding importance is the spreading and consolidation. It is not generally realized how intimately the stability of tar/aggregate mixtures depends upon these factors, which seldom receive the proper care and attention they deserve. With the improvements that have been brought about in the design of mixtures, the full advantages of their structural efficiency can only be obtained when the materials are evenly spread and thoroughly consolidated on the foundation. Failure to accomplish this will result in a surfacing whose resistance to displacement under traffic and durability will be considerably lessened, in spite of all the care and attention bestowed upon the design and quality of the mixture.

Institution of Gas Engineers

In this, our Third Institution Number, we publish the written contributions to the discussions, together with the Authors' replies, on the Papers presented at the Annual Meeting of The Institution of Gas Engineers, London, June 4-7. Our first Institution Number on May 29 contained abstracts of the Papers, while in our issue for June 12 was a full report of the verbal discussions.

NATIONAL POLICIES GOVERNING
The Testing of Gas Appliances

By STEPHEN LACEY, B.Sc., M.Inst.C.E.,
Controller of Gas Sales,
AND
C. A. MASTERMAN, M.A., F.I.C.,
Chief Technical Officer, Watson House, Gas Light and Coke Company

Mr. W. W. Townsend (Colchester) wrote: The Authors appear to have made out a good case for their proposals having regard to the facilities for testing which are now in existence in this country. However, they have devoted most of their attention to gas appliances themselves, and have made only passing reference to the question of installation and maintenance, and in my opinion these three questions cannot be separated as they are all vitally important. The Authors state: "If the appliance or installation gives cause for complaint, the consumer is accustomed to complain to the gas undertaking, which is scarcely able to evade responsibility even if it so desired." With every deference, I venture to disagree with the first part of this statement, and I think it is extremely unwise to rely upon the uninstructed public making complaints.

In the course of a census examination of gas appliances which was recently made, we discovered no less than twenty geysers on one estate which had been fixed by a builder, and which were unsafe because they were not fitted with bafflers of any sort; they had been used without complaints for months. For several years now there has been in existence a standard specification on the fixing of geysers, issued by the National Gas Council, and, in common with other undertakings, we have taken pains to bring this specification to the notice of all the local builders and plumbers, and yet the dangerous work goes on. It should be an offence to supply geysers which do not comply with certain minimum requirements as to safety or to fix them except in accordance with the specification.

In reporting upon the methods adopted in France, the Authors say " . . . unstamped appliances are sold by retail dealers who may be more concerned with immediate profits than with the safety and satisfaction of the gas consumer." There we have the real difficulty. It is, I believe, true that the gas undertakings now throughout the country play a predominant part in the sale and installation of gas apparatus, but there still remains the work carried out by the speculative builder, and there is nothing at present to prevent him from buying unsafe apparatus and having it fixed by a totally unqualified person without any notice being given to the gas undertaking. In my opinion we shall never solve the problem without legislation.

There are national regulations with regard to water fittings, and only qualified men are registered as plumbers. Even in the cheapest houses now being erected, the water fittings can be depended upon. But this is not always the case with gas, for the simple reason that we have no legal powers to fix certain minimum standards either in apparatus or methods of fixing. I would draw attention to the "Model Specification of Water Pipes and Fittings" published by the Ministry of Health in 1924 (re-printed in 1935), which resulted from the deliberations of a Committee, representing all interests, which was appointed by the Ministry of Health in 1923.

There is a reference in the Paper to Hungary, from which I quote the following: "Appliances do not bear a mark of approval, but there is authority to cut off the supply of gas if the appliance is dangerous." In this matter practice in Hungary is ahead of that in this country because gas companies here do not possess this power, although certain municipal undertakings have it. We should be in a vastly better position now if the Industry had in the past shown more courage in dealing with this matter, and I shall be glad to have the Authors' views upon this aspect of the subject.

A System for the Small Undertaking.

Mr. F. C. Briggs (Dudley) wrote: The Authors draw a picture of the result of a completely effective system of testing which leads even to a follow up on maintenance in consumers' houses. I would not argue whether this really is a logical conclusion, and I am certain that any system of testing, however simple, that was adopted would lead to more comprehensive schemes. But I would like to make the point that a much less elaborate system of testing would be of immeasurable value to small and medium size undertakings—undertakings that cannot organize effective testing Laboratories for district appliances of their own.

During the presentation of the Paper and during the discussion the question of safety has been continually stressed. Safety is undoubtedly of the utmost importance, but it is not the only point that I think should be borne in mind. Mr. Lacey in his introduction said that the discriminating buyer did not always purchase the article of the cheapest price, nor, I suggest, does he always agree that the dearest article is the best. Difficulties arise with the Engineer of a small Works in deciding whether some new appliance which is put on the market at a cheaper price than some existing appliance is really satisfactory or not, and is worthy of support. It is in this direction that some national chain of testing Laboratories could be of considerable assistance.

I suggest it should be quite easy to organize and extend existing laboratories into a national chain of testing laboratories to which it would be possible for either manufacturers or undertakings to send appliances or fittings

and obtain a certificate upon certain definite points upon which they might require information—*e.g.*, it should be possible to obtain definite certificates of radiant efficiency of gas fires, efficiency of geysers, the effect of wear upon hot pressed taps compared with cast taps, all these tests being carried out under certain standard conditions. There would, of course, be a fee for such tests, and the laboratories could be self-supporting. Such a scheme as this would in no way standardize appliances or retard progress in design.

The Authors add considerably to the value of their Paper by making constructive proposals. Whether these proposals give the best possible scheme needs further consideration to decide. There is one point upon which I strongly agree with them—and that is, any chain of testing laboratories or any scheme of this kind should be under the ægis of The Institution of Gas Engineers which is the technical body in the Industry.

The Authors suggest that membership of the panels they propose should be in no way conditional upon membership of the Institution itself. The inferred point of the Institution membership of technical men who are not Gas-Works Engineers has been touched upon by contributors to the discussion. I think it is an open secret that those who fathered the obtaining of the Charter by the Institution and the widening of the Rules of membership were themselves dissatisfied by being compelled to accept a much narrower definition of the term "Engineer" than they considered should have been the case. They were so compelled in order not to endanger the granting of the Charter.

It is, however, to be hoped that in the near future some way may be found whereby true technicians in the Gas Industry may be admitted to Corporate Membership of the Institution and not only to Associateship upon which arrangement some technicians have expressed their view that it infers a grade of inferiority. Such, in fact, is not really the case, nor was it so intentioned, but it certainly would be to the benefit of the Industry if such feeling could be removed.

In conclusion may I say that it is devoutly to be hoped that the matter having been so well ventilated by the Authors will not now be allowed to rest until something definite has been done in this matter.

Mr. R. D. KEILLOR (Greenock) wrote: It is notable that the highly constructive Paper by Mr. Stephen Lacey and Mr. C. A. Masterman concludes with a proposal that "four Registers or Panels be set up by The Institution of Gas Engineers in order to create a corporate feeling and a technical self-respect among Utilization personnel." In view of this fact and with the knowledge that Mr. W. B. McLusky's useful Paper on "The Gas Account" suggests the setting up of a "National Gas Board" it would appear desirable that the respective objects and the somewhat complicated inter-relation of the various national bodies presently serving the Gas Industry should be vividly presented to everyone who has the future welfare of the Gas Industry at heart. The accompanying explanatory diagram is therefore submitted.

THE AUTHORS' REPLY.

Mr. LACEY and Mr. MASTERMAN, replying to the discussion, wrote: We are very much indebted to those who have added to the value of our Paper by contributing to the discussion, orally or in writing. We do not propose, however, to reply at any length because we have already expressed our own opinions, and it now rests with the national bodies to decide what line of action to take. But we are glad of this opportunity of clearing up some misunderstanding of our point of view.

It has been suggested that we have confined ourselves too exclusively to the design of gas appliances and have paid insufficient attention to their proper installation and maintenance. That misunderstanding is doubtless due to the fact that the greater part of our Paper deals with the testing and certification of gas appliances. But the truth is that our proposals, designed to encourage the further development and co-ordination of gas utilization personnel and technique, have been largely based on our recognition of the fact that design, installation, and maintenance are intimately and unavoidably related.

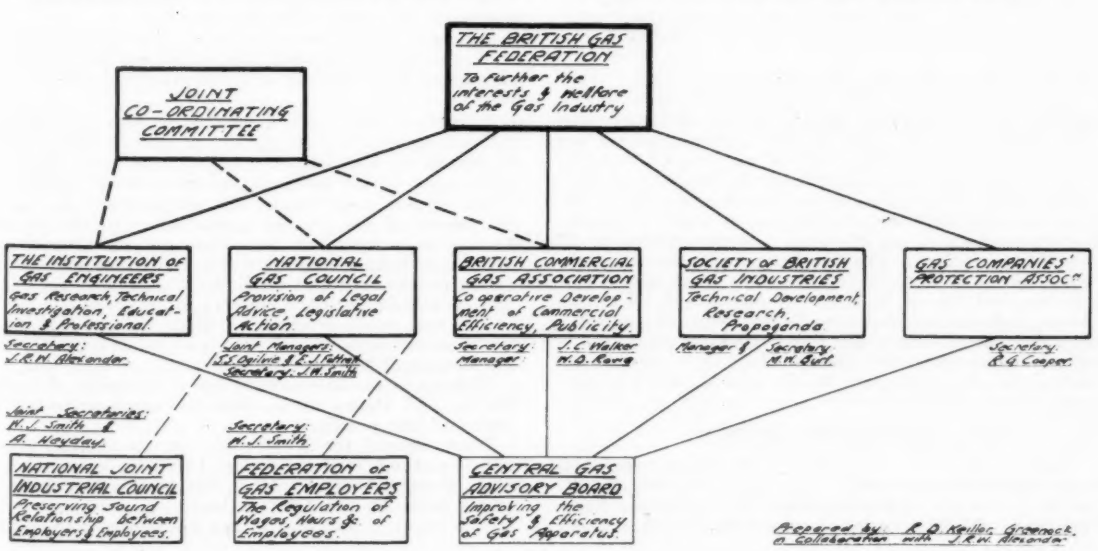
We believe that the future of the Industry will largely depend on the satisfactory operation of gas appliances under working conditions in *all* respects, but we do not think that, in this country at least, the desired progress would be made by legal restrictions or rigid specifications. What is needed is a greater spread of reliable information and the progressive education of gas utilization personnel—especially in gas undertakings—who will apply that information in actual practice. Gas undertakings that use to the full their opportunities of cultivating close relations with builders and others installing gas appliances will find no insuperable difficulty, we believe, in seeing that their own installation technique is closely followed.

Great stores of information are being acquired within the Gas Industry as a result of laboratory and district experience on matters relating to domestic gas usage, illumination, and research, but there are no normal means for distribution and exchange of this information. As a result, there is inevitably much waste of effort, much duplication, and the commission of many unnecessary mistakes.

Those concerned with the operation of the Industrial Gas Development Centre scheme are familiar with the increasing number of enquiries received which relate to matters outside industrial technique and which could easily be dealt with by some simple extension of the Scheme. One form of such extension is that dealt with in our Paper which has the merit of simplicity, of absorbing quite as many existing committees as it creates new ones, and requiring no prior setting up of organizations or constitution.

We have recommended the extension of the Industrial Gas Development Centre scheme to cover the whole field of gas utilization because it is already well established and doing excellent work so far as the use of gas for industrial and commercial purposes is concerned. It is not open to the objection of excessive centralization, but its continued success, either with its present limited scope or with the more comprehensive scope we envisage, presupposes the readiness of the large "centre" undertakings to accept

CHART SHEWING RELATIONSHIP OF NATIONAL ORGANISATIONS SERVING THE BRITISH GAS INDUSTRY AND THE NAMES OF PRINCIPAL OFFICERS


THE BRITISH GAS FEDERATION
To further the interests & welfare of the Gas Industry
JOINT CO-ORDINATING COMMITTEE
THE INSTITUTION OF GAS ENGINEERS
Gas Research, Technical Investigation, Education & Professional
Secretary: J.R.W. Alexander
NATIONAL GAS COUNCIL
Provision of Legal Advice, Legislative Action
Joint Managers: S.S. Ogilvie & E.J. Talbot
Secretary: J.H. Smith
BRITISH COMMERCIAL GAS ASSOCIATION
Co-operative Development of Commercial Efficiency, Publicity
Secretary: J.C. Walker
Manager: H.O. Rees
SOCIETY OF BRITISH GAS INDUSTRIES
Technical Development, Research, Propaganda
Manager & Secretary: H.H. Burt
GAS COMPANIES' PROTECTION ASSOC.
Secretary: R.G. Cooper
Joint Secretaries: H.J. Smith & A. Hayday
NATIONAL JOINT INDUSTRIAL COUNCIL
Preserving Sound Relationship between Employers & Employees
Secretary: H.J. Smith
FEDERATION OF GAS EMPLOYERS
The Regulation of Wages, Hours & of Employees
CENTRAL GAS ADVISORY BOARD
Improving the Safety & Efficiency of Gas Apparatus
Prepared by R.D. Keillor, Greenock, in Collaboration with J.R.W. Alexander

responsibility for and invest considerable sums of money in building up the Centres; and upon the support, financial and otherwise, given to them by other undertakings in the same regional area.

Some of the contributors to the discussion wished to create a new national body to deal with technique on the utilization side of the Industry. In the Authors' opinion the creation of such a body is not a necessary preliminary to a closer degree of co-operation between all those engaged on the utilization side and, indeed, it can be maintained that the less rigid and formal the organization, the more rapid and vital will be our progress.

PROBLEMS AND ANSWERS IN

The Reconstruction of Manufacturing and Distribution Plant at Nottingham

By GEORGE DIXON,
B.Eng., Assoc.M.Inst.C.E.,
Engineer and Manager of the City of Nottingham Gas Department

Mr. G. C. PEARSON (Birmingham) wrote: Mr. Dixon referred in his Paper to the 6-day working week in operation at Nottingham, and some few words on this matter may be of interest. A 6-day working week has been in operation at Birmingham since August, 1923, and has worked without any hitch from that time until the present. The scheme is very much appreciated by the men, who would not on any account wish to return to the old conditions. While arranging for continuity in the working of the gas-making plant, the scheme provides that no man shall work more than six days each week, and shall take an " off " day in that week. The scheme further allows that the " off " days in succeeding weeks shall be progressively on different days of the week, so that it becomes obvious that in order for a man to take an " off " day on Monday in one week, Tuesday the next, and so on, each man works actually a period of seven days consecutively, taking an " off " day on the 8th day. It will be seen that after five weeks of this rota the " off " day of the 6th week is at the end of that week, and the " off " day of the 7th week must commence at the beginning of the week, so that these two " off " days fall consecutively.

It will be noted that as Mr. Dixon starts his nominal week on Friday the two " off " days falling together are Thursday and Friday, and as the men finish work at 10 p.m. on Wednesday after the afternoon shift, and recommence at 10 p.m. on the night shift following the " off " day on Friday, the period away from work is 48 hours only.

In the 7 weeks of the rota the total time in " off " days under any arrangement of the scheme is 264 hours, and at Nottingham this is made up of 5 breaks of 48 hours, and one of 24 hours. In Birmingham the nominal week commences on Sunday, and the rota is so constituted that the two " off " days that fall together are Saturday and Sunday, and as the men at this period finish work at 2 p.m. after the morning shift on Friday, and re-start at 2 p.m. for the afternoon shift on Monday, a break period of 72 hours is thus arranged. For the 7 weeks in the Birmingham rota the " off " day breaks are three of 48 hours, two of 24 hours, and one of 72 hours as mentioned. This 72-hour break, known by the men as " the long week-end off," is a very distinct feature of our 6-day working week, and is very much appreciated by them. They look forward to this period, save and prepare for it, and it forms a very great attraction to the scheme.

THE AUTHOR'S REPLY.

Mr. GEORGE DIXON, replying to the Discussion and Written Contributions, wrote: In reply to Mr. R. E. Gibson, it is possible to produce coke of any desired moisture content. We first supplied coke with less than 2 per cent. water, but this caused excessive dust in the retort house and screening house, and our consumers complained for the same reason. We have now standardized at 4 per cent., which appears to meet all conditions and gives a silver-grey coke which is very popular for both domestic and industrial purposes.

I agree with Mr. Gibson with regard to ideal arrangements of units of carbonizing plant, and our programme has included the division of all plant into six separate units, so that one can be repaired each summer.

I thank Mr. Gibson for the information he gives with regard to his method of cooker renovation at Liverpool. I am surprised that 20 minutes is found sufficient for proper incineration. Our experience is that it takes two hours to recover the temperature of the oven after the new charge is placed in. A further ¾ hour's soaking at 800° F. is then required to ensure that the castings, linings, and packing are adequately burnt off. The average gas consumption per cooker given includes that required for the first heating up in the morning.

Shot blast has been adopted in order to avoid the dust nuisance caused by hand brushing, and to ensure a perfectly clean smooth surface for the spray paint treatment.

I thank Mr. J. T. Haynes for his remarks on his experience with coke oven gas supplies.

In answer to the question with reference to the central heating plant at the Distribution Shops, the three units are arranged so that any one can be run separately for the purpose of test and instruction of our selling staff. The recommendation to a consumer is, of course, dependent upon many local considerations which have to be assessed on the consumer's premises.

In reply to Mr. F. G. Shaw, the coke made for sale per ton of coal carbonized up to date is 10·52 cwt. Some has been used on works boilers, leaving 10·1 cwt. for district sales. The coke made from our fuels is light, readily ignitable, and free burning, and does not require any added treatment to make it suitable for domestic purposes. The total sulphur compounds in the town gas amounts to 23 grains.

In reply to Mr. J. Mitchell, the wear and tear details of the Undulo rubber belt coke screen are given on Plate 2 of the Paper and the estimated life and costs on Table 13. After seven months' working we find we are getting a longer life from the rubber mats than we anticipated. The life is determined by the holes becoming large or distorted, but it has been found possible to delay this by turning the mats round. The mats of the second four sections (boiler nuts size) were changed round after 23 weeks' life when they had dealt with 6,393 tons, and are still in use after 31 weeks' life during which they have dealt with 8,789 tons. The mats on the first two sections (beam size) were changed round after 29 weeks' life (9,591 tons) and are still in good condition after 31 weeks (10,121 tons).

We have had no cases of any " visitors " surviving the cooker incineration plant, and we do not think there is any risk after withstanding a temperature of 800° F. for two hours.

In reply to Mr. T. R. Cook, the repairs to plant given in Table 1 apply to the old plant and may be taken as normal. It should be noted that they refer to year ended March, 1932, prior to the author's appointment to Nottingham.

The importation of road tar and products due to the displacement of coal to gas works refers to the necessity of transporting road tar, &c., from outside areas into those areas now taking coke oven gas and which used to carbonize their own coal and distil their own tar. I do not refer to importation into the country from abroad.

The coal analysis given in Table 8 is on the wet basis. Total moisture is 7·5 per cent. and volatile matter (excluding moisture) 34·1 per cent.

The pit prices are normal for the quality of coal in the Notts. and Derby areas, but the carriage is low due to geographical position.

I am obliged for Mr. Cook's details of his water treatment, and confess I am relieved that we have not a similar class of water to deal with at Eastcroft. Nottingham town water costs 9d. per 1,000 gallons.

The capital cost of the tar plant was £18,600 in 1920

and the total tar distilled last year 1,868,200 gallons. The capital charges will therefore be met by 3s. per ton tar.

Not Applicable to Other Districts.

Mr. E. Crowther pointed out that the economics of the Nottingham position are not necessarily applicable to another district, and I am in complete agreement with him. The reason why I included in the Paper such details of early considerations was clearly to show this very fact. I believe that there is not likely to be any great change in the relative figures of coal and by-products in this area.

A good market for continuous vertical retort coke has been established for some years and the demand for dense horizontal type coke is very small. There is competition from furnace cokes, but consumers will pay a much higher price for Nottingham coke because of the care taken in its preparation and the fact that it is very porous and free burning. Intermittent vertical retorts would not have given us the type of coke best suited to our market, and the risk of nuisance is much greater than from continuous vertical plants.

The quality of the Notts. and Derby coals does not leave much margin for benzole extraction when working on steamed vertical retorts at 475 B.Th.U. The question did not receive consideration in the Eastcroft scheme as we had tried to make out a case at Basford some two years ago and failed.

Air injection is worked on the producers normally, but a slightly increased pressure is desirable when using breeze above 30 per cent.

Provision is made to pass live steam through a reducing valve at 25 lb. per sq.in. to the exhaust line from the generator engines to the retort bench in case of there not being sufficient steam passing through the engines at light load. Any excess exhaust steam is blown to atmosphere.

In practice it is found that the variation in load on the generators is not very great—the lighting load at night balancing the coal elevating load of the day.

The temperature of the cyclone tar extractor is 140° to 155° F. No efficiency tests have been made. The cyclone was put in primarily as a static condenser to relieve the water consumption on the water condensers. The tar runs to the main well with all other tar and liquor.

We have not found any inconvenience in the intermittent movement of the relief shift to and from the yard gang. The same men form the relief each time and a chart hanging in the mess-room shows the men which relief shift they are on, or whether they are in the yard, during the whole cycle of seven weeks.

The earlier part of Mr. J. H. Clegg's criticism deals with questions of the cost of coal and repairs at our three works (Table 1). These figures referred to the year ended March, 1932, and we do not, therefore, propose to deal further with them. The naphthalene stoppages were due to old deposited naphthalene from horizontal retorts. A temporary washer was put in on the horizontal gas streams only to ensure that no further naphthalene was sent out from the Works. The " Dri-gas " plant has been in operation for two years, and no bad effect upon dry meters has yet made itself felt. No trouble of corrosion of boiler or condenser tubes has been experienced. We are aware of the possibility, and the position is being carefully watched. Although we have installed two waste-heat boilers, there has only been waste heat enough for one owing to the very low producer fuel figures being obtained. We believe that through the augmentation flue we could easily provide all the works steam requirements, but we have not yet had actual experience of this, although it is being successfully done by other engineers in the country.

I thank Mr. C. G. Pearson for his written contribution dealing with the details of the six shift week as worked at Birmingham.

The Gas Account

By W. B. McLUSKY,

Engineer and Manager of the Halifax Corporation Gas Department

Mr. GEORGE EVETTS (London) wrote: I should like to add the following remarks to the contribution I made to the Discussion at the Meeting, which, owing to the limited time available, was made as concise as possible. The object of my spoken criticism was not to belittle in any way the important contribution that Mr. McLusky has made to the Industry in the matter of tariffs, not only in submitting his Paper but in putting these various tariffs into operation.

For many years Mr. McLusky has not only advocated the introduction of alternative tariffs but he has put them into operation when others have feared to do so.

The great difficulty arises when introducing a tariff when no surplus revenue is available. A straight calculation can be made showing the loss which would be entailed if all consumers chose the most favourable form of tariff, but it is extremely difficult to estimate the increased consumption which will mature from these consumers.

It would be useful if Mr. McLusky would extend Table 2 by giving not only the rental corresponding to columns 4 and 5 but the total gas consumed according to columns 4 and 5 together with the corresponding rental for all consumers adopting Scale 2. If the increased receipts more than cover the bare increased cost of production, then very little criticism can be made on this scale by itself.

A tariff is often designed merely for expediency, generally to get some business which would otherwise not be obtained, or to prevent business from being lost, which is equally important (and sometimes more so). It is difficult to avoid unsound tariffs when expediency is the only consideration and it may be that some of the economic points have been overlooked in devising these Halifax tariffs, thus creating anomalies to which I drew attention; multiplicity causes a certain amount of confusion, when simplicity should be the aim of the Industry.

If a tariff is sound the undertaking should prosper whether the increase in business is obtained from additional customers or from existing customers.

THE AUTHOR'S REPLY.

Mr. W. B. McLUSKY, replying to the Discussion and Written Contributions, wrote: It was suggested that I might have summed up the whole case for Tariffs in a conclusive and convincing statement. The conclusion to this great question will not be found by one person, nor will the difficulties in the way be cleared up without effort. The fact that the great men of the Industry—those whom we accept as our leaders—have never produced a scale of charges, is proof, if proof were needed, that a solution has not been found. The engineer and manager of a gas undertaking puts in a full day. It is only as " evening twilight gathers round " that he has time for reflection, and those who complain that there is no stimulus in effortless recreation will find any amount of stimulus in a game of Gas Charges!

Emphasis was laid on the need for figures and calculations and cost schedules. For example:—

> " . . . we should endeavour to understand clearly the effect and the economics of the cost of supplying . . . "
> and
> " . . . you cannot arrive at any conclusion . . . until you have first analyzed your accounts."

It is unkind, if not unfair, to suggest that the members of The Institution of Gas Engineers have not done these things.

Colonel Carr was good enough to describe himself as an early disciple of mine. In some of his remarks there was a suggestion that he was a " disciple who followed afar off."

The Halifax figures which Colonel Carr criticized differed from his own figures only in detail. The cost of providing for the consumer's demand *varies between town and town*. The cost of providing for each group of consumers varies in accordance with the cost of providing for those consumers' maximum demands. The price of the commodity may be the same to all persons, whatever their demands may be, but the ultimate " all-in " price, *plus* the demand charge, will vary with the exercise of the consumers' demand in any town. There are other differences. These differences are not in the ascertained facts themselves, but in the use we make of the facts.

Colonel Carr, for example, makes a service-rental charge of ten shillings per quarter for domestic purposes, but this charge does not apply to all the houses in his area; it

applies only to houses of a certain size. In larger houses, the sizes of which were not mentioned, the service-rental varies with the consumers' maximum demands.

All this follows closely the Halifax model. The only difference is that in Halifax the service-rental varies in accordance with the size of the house, *from the smallest house upwards*. The service-rentals vary from 6s. 6d. to 19s. 6d. per quarter; so that the only difference between Colonel Carr's *interpretation* and application of the schedule and ours is that we charge some people less than 10s., some people 10s., and some people more than 10s., whereas Colonel Carr charges them all alike. Colonel Carr gives consumers in the larger houses the option of having the service-rental assessed upon the maximum demand of the appliances installed. That is precisely what we in Halifax do. In Scale 3 of the Halifax Scales of Charges provision is made for the assessment of the consumer's maximum demand in the larger houses. This is explained in the Paper:—

> "The customer may say: 'I don't want to pay a service-rental based upon the assessable value of my residence. . . . I want only a gas fire, or a water heater, or a complete equipment for my kitchen or laundry.'"

Mr. Evetts seemed to assume that consumers who have signed contracts under Scales 2 and 3 can break such binding contracts. Scales submitted to municipal corporations are subjected to the most critical examination and scrutiny, and must be submitted to, and approved by, finance committees who are advised by responsible and competent officers, before they are approved. It is foolish to suggest that such contracts could be broken at the whim or fancy of the consumer.

A Plea for Simplicity.

Mr. Evetts pleaded for simplicity, but simplicity must not be carried to the extent of injustice. A simple uniform service-rental of 10·8d. per week per consumer supplied with a commodity charge of 1s. 3d. per 1,000 cu.ft., will produce all the revenue required by the Halifax Gas Undertaking in one year. That would be very simple, but most unfair and unjust, as we have proved by the cost schedules.

We grade the service-rentals. Some pay less than 10·8d. per week, and some pay more, according to the ascertained cost of providing the supply. This is more than simple: it is fair. Colonel Carr was unkind enough to suggest that, if he were a consumer of gas in Halifax, he would have difficulty in understanding how he should be affected by the Tariff. The occupants of the smaller houses in Halifax have never asked us to explain to them why they must pay less than those who occupy larger houses; and those who live in larger houses are pleased and proud to pay more. The grading of the demand charges in Scale 3 calls for explanation. This grading was done expressly for the purpose of relieving small users for industrial purposes on the one hand and the domestic section of the same group on the other hand. Scale 3 is a "combined" scale.

I agree with Mr. Ridley that the quantity of gas in the first block, Scale 3, is high. That will be remedied as soon as the surplus revenue will provide the funds, and that can be done without upsetting the curve described in Figure 7.

The figures of *Table 2*, which were also referred to by Mr. Curtis, are, as Mr. Ridley pointed out, not representative. The representative figure—the average for all the consumers on this Scale—is set out in Table 3.

Mr. Evetts complained that, in Scale 6, the last two blocks might come on the hour of the peak load. In Halifax, the hour of the peak load occurs between 9 and 10 o'clock on a June morning, and between 4 and 5 o'clock on a winter afternoon. This was explained in my previous Paper to the Institution in 1926. We carry Public Lighting over the peaks. We carry Central Heating over the peaks. The load factor for Public Lighting, Central Heating, and for the business done under Scale 6, is a good one, and the Scales for these purposes, as I pointed out in the Paper, are commercially sound.

Mr. Ridley agrees that service-rentals for domestic consumers should be graded, but he prefers grading according to the number of rooms, without distinction as to the size of the rooms. He also agrees that, in a Block Scale, the size of the block should vary with the size of the premises, as illustrated in Figures 3, 4, and 5. Mr. Ridley finds that consumers generally prefer the block system, and that this system is more easily applied to pre-payment consumers. That is precisely our experience in Halifax. All the Halifax Scales of Charges are available to all consumers, for whatever purpose, whether the meter be ordinary or pre-payment. But, out of the 11,544 pre-payment consumers in Halifax not more than 200 have at any time accepted the Two-part Tariff.

I agree with Mr. Ridley that the service-rental system, the block system, and the stepped scale can be designed to produce the same income. This is pointed out in a remark printed below Figure 9 of the Paper:—

> "This diagram shows that a Stepped Scale and a Block Tariff may serve the same purpose,"

and under Figure 3:—

> "a Block Tariff and a Multiple Tariff may be equally serviceable."

And, as I pointed out in the Paper, the Block Tariff will produce the same income as the Multiple Tariff, provided the consumer uses the quantity of gas which the graphs show is necessary to discharge the consumer's obligation in respect of the amount required to meet the service-rental.

The Essential Difference.

The essential difference between the Multiple Tariff and others is that in the Multiple Tariff the customer commits himself to the payment of a service-rental, whereas in all other scales the customer is committed to nothing.

In Halifax, we started with a Block Tariff. The service-rental system was added—to stimulate the use of gas, not displace the Block System. The service-rental system and the Block System have worked successfully side by side in Halifax. Those consumers who were disposed to use large quantities of gas preferred to pay a service-rental and a small commodity price—smaller than we could afford to concede in a Block Tariff to consumers who, by the adoption of the Block Tariff, committed themselves to nothing.

It has been suggested that the higher price—the primary rate in the Block Tariff—is not quoted against us as the price of gas. That has not been our experience. Our competitors persist in quoting the price of the first block in a Block Tariff as the price of gas, and they as consistently advertise their commodity at 2½ units for one penny, without reference to the fixed charges or service-rentals, which may amount to £9 per annum per kilowatt of the consumer's demand.

The latest tariff quoted by the Halifax Municipal Electricity Undertaking, for business premises, retail shops and the like, is £9 per annum per kilowatt in the demand, with a commodity charge of ½d. per unit. Here is an example of the application of Multiple Tariffs for Electricity Supply in retail shops:—A consumer was, until recently, buying 2,000 units of electrical energy per annum, at the Flat Rate of 5½d. per unit, making the account for the year *£45 16s. 8d.* This system of buying naturally restricted the use of electrical energy in his premises. This consumer is now determined to make more generous use of the energy provided, to light his premises brilliantly and attractively; to use possibly 4,000 units during the ensuing year, as compared with 2,000 units during the past year; and for this increase of 100 per cent. in the amount of energy used his total bill will be £44 6s. 8d., made up as follows:—

	£	s.	d.
Charge per kilowatt of the maximum demand per *annum*	36	0	0
4,000 units at ½d.	8	6	8
Total amount per annum	£44	6	8

The kilowatt demand charge for industrial purposes, in the same area, is £5 5s. per K.V.A. of the maximum demand per annum, with a commodity charge varying from 6d. per unit down to a very low figure. The kilowatt demand charge for retail premises is an *annual* charge covering *summer* and winter months, whether energy is used or not, notwithstanding the fact that the shop-lighting year is one of only 400 hours, within the limits of the Shop Hours Act. When the consumer engages to pay a demand charge of £9 per kilowatt per annum, and is able to buy energy at ½d. per unit—which appears a low price as compared with a flat rate of 5½d. per unit—he will naturally use energy, for display purposes, greatly in excess of the hours during which his premises are open under the Shop Hours Act.

This is one of the advantages of a Multiple Tariff, and illustrates the advantage to be gained by fitting the Tariff to the consumer's circumstances, and encouraging him to make liberal use of the energy at a price that is commercially advantageous to the customer, and a good business proposition to the undertaking, taking into account the margin between "works cost" and the figure of ½d., which the consumer pays in addition to the demand charge, which is calculated to cover all expenses other than "works cost."

No Option.

I agree with Mr. Ridley that the high Flat Rate for electricity leaves the consumer no option other than the Multiple Tariff.

I pointed out in the Paper that the Norwich system for

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MINETTE
GAS COOKER
The Parkinson "Minette" is available in a variety of designs, giving a wide choice of neat, compact models ideal for small houses, flats and bungalows. Furthermore Gas Engineers will find the alternative range of hot plates a valuable aid in satisfying the varying requirements of consumers, whose kitchen space is limited. The choice of hot plates for the No. 1212 Models is as follows :—
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No. 1112
WITH PLATE-RACK
No. 1212
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WHICH ACTS AS A SPLASH
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AVAILABLE IN A VARIETY OF MODELS *for the* SMALL KITCHEN

THE PARKINSON STOVE COMPANY LTD. BIRMINGHAM

London Showrooms: Terminal House, Grosvenor Gardens, S.W.1

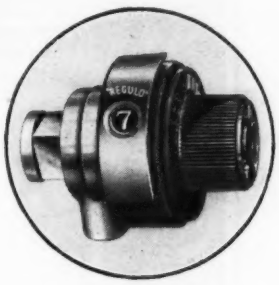
MEMBER OF THE SOCIETY OF BRITISH GAS INDUSTRIES

FIRST IN

Daily
WALLIS'S
AUTUMN SALE BARGAINS
BARKERS
AUTUMN GLOVE WEEK
GAS COOKING
at pre-war cost !
The "New World" Cooker uses less gas because it makes the gas it uses give more cooking heat. It not only makes gas cooking more economical, it makes it simpler and cleaner. And it does better cooking.
The heat neither obscures nor disturbs the view. Nothing can clog the boiling hot-plate. There are no grates there to need cleaning. None of the flame is wasted. It is used to the last degree of gas heat. With the "New World" Cooker you know exactly what you are doing without looking
The wonderful "Regulo" Heat Controller which is fitted to the "New World" Cooker is automatic in its action, and keeps the oven at exactly the temperature you require. Once you have set the cooking time you need not worry. The "New World" Cooker will do the cooking for you, and switch off when it is done. The cooking goes on and on without your attention.
The "New World" Cooker is fully the advantages you need to have on cooking gas. Let the cheapest rent be fully the advantages you have to pay. Now is the moment to get a "New World" Cooker. Call at your gas showroom or write for free descriptive booklet.
The "New World" Self-Controlled Cooker that reduces gas bills
Radiation
PARNELL
OUTSIZE
SLIPPERS

One of the earliest series of "New World" Cooker advertisements in 1923.

1923 . . . Regulo Oven-Heat Control is easily supreme to-day



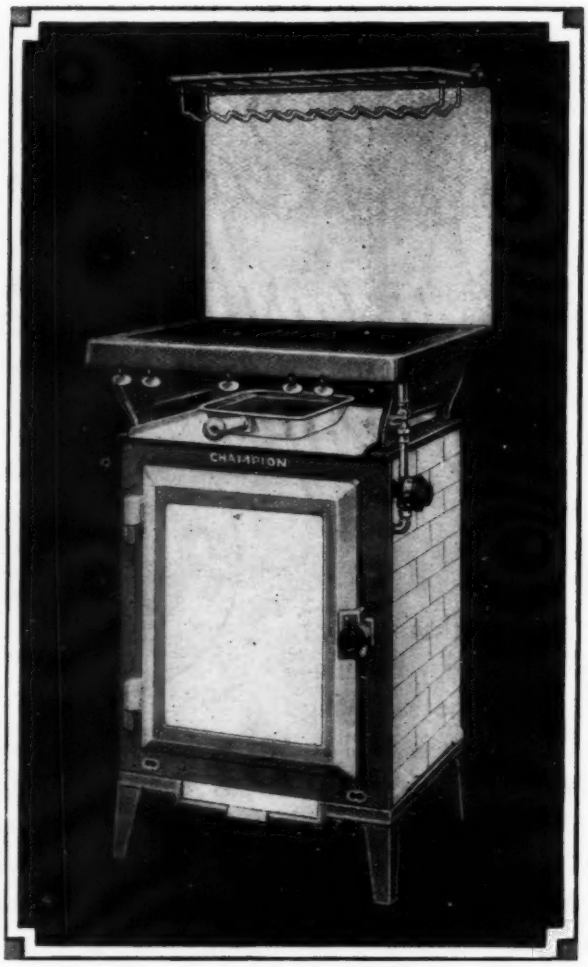
GAS Undertakings that adopt the "New World" Regulo-controlled Cooker have the satisfying assurance that its popularity is well-rooted and widely diffused. Ever since its introduction in 1923 it has been advertised, in successive yearly campaigns, in which the most powerful National Daily, Weekly, and Sunday Newspapers, together with the Weekly and Monthly Magazines, have all been consistently used. Moreover, costly auxiliary advertising, such as Cinema films, Railway and Tube advertisements, Omnibus Posters, etc., have been called into service at various times, so the "New World" Cooker is known far and wide as "in a class entirely by itself" for service and satisfaction.

REGULO-CONTROLLED

NEW WORLD

COOKERS AND RANGES

The Cannon "Champion" Cooker



- Unique advantages of *double* insulation.
- Ease of cleaning *inside* the oven.
- Burners adjustable *from the front*.
- *Concealed* supply pipes.
- Patented *covered* grill.
- *Deep* cornice and *drop-handle* taps.

Sole Makers: Cannon Iron Foundries, Ltd., Deepfields, Nr. Bilston, Staffs.

Included in the KING'S HOUSE

the supply of electrical energy made progress only after the alternative Flat Rates were raised.

It is not suggested that gas undertakings should raise the primary rate in a Block Tariff, to drive consumers to the alternative of a Multiple Tariff. As I pointed out in the Paper, a high Flat Rate or a high primary price in a Block Tariff drives the consumer of gas to alternative forms of energy!

We cannot meet the competition of to-day with the methods of yesterday. We agree that price alone, without service and salesmanship, will not effect a sale; but we also know that, however attractive the display in our windows may be, the customer always scans the price.

Mr. Ridley asked: "How many consumers are on Scale 7, and what is the consumption of gas per meter?" The number of consumers is 110. The average consumption of gas per consumer is estimated at 49,275 cu.ft. per storage heater per annum. The consumption of gas is not ascertained by meter; the storage water heaters are coupled direct to the service pipes communicating with the street mains. The consumption of gas is checked periodically and systematically by means of charts, which indicate the period of the demand and the amount of gas taken. "Check" meters are also installed, without discrimination, to check the volume of gas consumed over a period of twelve months. The consumption of gas rarely exceeds the volume estimated. The work of fixing heaters under this system was interrupted as the result of an appeal from the local Master Plumbers' Association. I have supplied some further details to Mr. Ridley on this subject.

Mr. Ridley sees no advantage in the Gas Unit as a selling point. To test this, I made enquiry recently in a business house in London, as to the prices charged for gas and electricity. I was promptly told that the price of gas was 8d., and the price of electricity ½d. Neither therms nor units were mentioned. This information was given to me in the head office of a firm whose business is the organization and equipment of offices with costing systems! Had the price of gas been expressed in terms of units, the answer would not have sounded so prejudicial to gas.

Mr. Ridley quoted the example of an electricity tariff in which the primary quantity was 32 units, and a scale of gas charges in which the primary quantity was 750 units. I should submit, with great respect, that this example emphasizes the disadvantage of a Block Tariff. If the consumer could be persuaded to pay Mr. Ridley's small service-rental, and buy his 750 units of gas at ¼d. each or less, the electricity primary rate for the 32 units would suffer in comparison.

Mr. Haynes suggested that a lead should be given to the Industry; that the engineers were waiting for a lead; and that a *simple scale of charges* might be evolved, which engineers might be induced to try. Mr. Haynes himself has given a substantial lead.

It was suggested that, in Example C, the Multiple Tariff had only recently been introduced, and that consumers had not yet had time to respond. That is so. The Multiple Tariffs have been in operation for only twelve months.

Increasing the Gaseous Therms.

The reference to coal less residual products was introduced for the purpose of emphasizing the fact that, during the past twenty years, the tendency has been to increase the number of gaseous therms available for sale. This increase represents nearly 50 per cent. in the case of A. In ascertaining the net cost of coal less residual products, we have a divisor here inflated by nearly 50 per cent.; and consequently, if the item for coal less residual products had increased by 50 per cent. during the past twenty years, the figures representing net coal less residuals would be the same for both periods.

Mr. Ingham pointed out that a company cannot go very far; that a municipal authority is "not tied up" to the same extent as a company. *A municipal authority can charge what it likes*, provided *that the charge does not exceed the maximum fixed by Parliament*. That point is dealt with in Appendix 3 of the Paper.

Mr. Ingham showed that his undertaking had courageously increased the price of gas from 7d. to 10·8d. per therm for the first five therms used per quarter, and advised other undertakings to consider seriously the advisability of increasing the price for the first small quantity. He mentioned that there had been some little opposition to this policy, but the figure of 10·8d. was not quoted against them as the price of gas. I know from personal contact with the speaker that he has been uniformly successful in all his work, and the sale of gas is increasing by leaps and bounds in his area. It was this undertaking that I had in mind when I produced the diagram in the Paper.

I agree with Mr. Curtis that it is the total at the bottom of the account, and not the details, that concern the consumer. That being so, it would be better, I submit, *to tell him*, before the quarter begins, *the total amount he is to pay in respect of a service-rental*, and then make the price per therm so low that a variation in the amount of gas consumed would cause the consumer neither concern nor embarrassment. This point is dealt with in the Paper.

Mr. Curtis put the question in the form of a quotation:—

> "Just precisely what load . . . do we hope to secure by the adoption of the Two-part Tariff?"

The answer to this question is set out in the Paper.

Mr. Curtis pointed out that there is no hope of increased business for domestic purposes, unless it is in the sale of gas for heating purposes, and proceeded:—

> ". . . that the main load one would expect to obtain was the domestic heating load,"

and that such business would tend to increase the demand for gas in winter, but not in summer.

Mr. Curtis asked:—

> "What proportion do the 88 accounts (Table 2) bear to the total number of domestic consumers?"

The answer is set out in Table 3. The 2,772 customers referred to in column one include the 88 set out in Table 2.

Mr. Curtis asked:—

> "What proportion does the summer business bear to the winter business?"

The answer is that the winter accounts in the 88 cases referred to are invariably 25 per cent. more than the summer accounts.

It is suggested that Table 2 would have been enriched by the addition of a column giving the amount of money received for the amount of gas used. That is true, but I am sure any member would not grudge the time necessary to make these calculations for himself, from the information supplied.

Mr. Curtis complained that the reductions in Scale 1 are too small in comparison with the consumption required to qualify for a reduction. This Scale is designed for the intermittent user. In the Paper, I said (below Figure 6):—

> "The Scale is constructed to meet the cost of supplying gas for intermittent use."

But no one, by looking at the Scale, can tell whether the reductions in the price per therm are too small or not. This is a *volume scale*, and whether the "all-in" price is too high or too low depends upon the *load factor*. This point is dealt with in the Paper:—

> "There are many consumers of gas who are not disposed to pay a quarterly service-rental charge whether they use gas or not."

On page 18, this question is again dealt with:—

> "Consumers whose hourly demand is large, but whose quarterly account is not large in proportion to that demand. . . ."

We cannot "scale down" the price to such consumers merely on the basis of the volume of gas consumed per quarter, without taking into account the maximum demand, and the cost of providing for it.

Mr. Curtis asks:—

> "What is going to happen when a tariff scheme is very successful?"

I should say:—

> "What will hapen to the Grid, puir thing?"

POLICY AND PERFORMANCE IN The Development of Gas Sales

By SAMUEL B. CHANDLER,
Distribution Superintendent of the Tottenham and District Gas Company

Mr. W. J. SANDEMAN (Croydon) wrote: I am in entire agreement with all the Author writes about personnel. This is a point to which the Industry has paid insufficient attention. I think we most of us recognize our mistake and are now doing our utmost to encourage a better type of employee in the Sales Department. I am glad the Author stresses the need for skilled salesmen and saleswomen. At Croydon we endeavour as far as possible to make our sales staff fully conversant with every article with which they are dealing. We go to the extent of giving them a course in our Workshops, so that they can learn something about the construction of appliances. That this policy has been amply justified is shown by our constantly expanding sales. Notwithstanding the growth of the district, I am sure that our sales would never have reached the figures they have but for skilled salesmanship. This is particularly true in regard to the technique of selling gas for water heating. The Author's methods of training are much the same as ours, and from the results that we are both obtaining I feel confident there is not much wrong with our methods.

In regard to the payment of commission, at Croydon we have been doing this for many years, and I am firmly convinced that it has had a very great influence on our sales. We restrict the payment of commission to goods sold either for cash or on instalment-purchase. Commission is not paid on goods supplied on hire, except in one or two special cases.

There is a point to which the Author does not refer, and it is one that we have found extremely helpful in promoting business. I refer to our schedule of standard charges for carcassing, the installation of apparatus, alterations of fittings, &c. By means of this schedule, a salesman is able to clinch an order in the showroom, or by correspondence or telephone, and this saves both the customer's time and our time. In addition to this, all prices quoted in our sales literature include fixing. We have found this a very great help in dealing with the public.

In regard to lady advisers, I am gradually working in the direction of having a lady adviser attached to each district showroom. When not visiting on the district she will be available in the showroom for advising customers, and here I would like to say that, generally speaking, the Industry is not paying sufficient attention to the cooking and home washing load. We are treating electrical competition too lightly, and I firmly believe that if we are to retain these loads we must very largely develop the Home Service Section of our business. There is, also, a growing tendency for the buying of tinned and ready cooked foods, and I believe that by helping and encouraging people to use their stoves we can recover a lot of this business. We have already done a good deal in showing people how to bake cakes at home instead of buying them ready cooked.

Then in the matter of home washing, by demonstrating in our showroom windows we have done a great deal in inducing people to wash at home instead of sending it to the laundries.

For several years now we have discontinued ordinary "straight" canvassing. We work on very similar lines to the Author. A letter is sent and is followed by a call of a representative to examine all the gas appliances in the house and to endeavour to secure additional business. This work comes under our District Development Section, which, also, includes a staff of men whose duty it is to call on prospective consumers coming into the district. To do this they frequently have to travel many miles outside our area. This service has proved of great value.

I am convinced that the Industry has got to pay more attention to our showrooms. They must be made bright and attractive, particular care being taken in window dressing. We have a lot to learn from firms like Woolworths and some of the leading drapers.

Like the Author's Undertaking, we at Croydon are doing all that is possible to fight competition in regard to domestic lighting. The switch is helping us to some extent, but I am a little surprised that the Author is recommending the catalytic type of ignitor. In its present form we have found it most unreliable. I disagree with the Author's policy of subsidizing builders for putting in gas points. I am afraid this policy gives rise to the impression that gas is no longer a necessity. I have set my face firmly against free carcassing, and, so far, we have always managed to obtain payment, which more than covers the cost to the Company. One further point in conclusion. It is not helping the sale of gas to be continually harping on its cheapness. It is far better to cut out this word and substitute reliability and efficiency.

THE AUTHOR'S REPLY.

Mr. S. B. CHANDLER, replying to the Discussion and Written Contribution, wrote: Sir Francis Goodenough very largely confirms the views expressed. I am glad to have had the opportunity of presenting a record of a distribution and sales scheme which has proved itself to be workable and satisfactory—the Papers referred to by Sir Francis can rightly be regarded as good starting points. All appreciate the valuable work done by the British Commercial Gas Association on the sales side of the Industry, particularly in connection with the Domestic Sales Scheme. The suggestion as to refresher courses is interesting, and with it the author is in agreement.

Mr. Arthur Roberts raises the question of pressures. The works governors do not entirely close down during periods of low consumption; during the day they are set in accordance with district demands to maintain 7-in. inlet at terminal governors. Trunk feeder mains to district governors carry pressures recorded at the Works of between 10 in. and 23 in. W.G. during the daytime as required, with the exception of Sunday when the maximum pressure from the Works is in the neighbourhood of 36 in. W.G. All mains are of cast iron. No "dust" traps have been installed but the syphons (which are now dry) occasionally collect dust and this is extracted by service cleanser.

The fee paid to gasfitters on emergency duty is 10s. per shift. No particular duties are imposed upon them while waiting for calls, but as they are responsible for the cleanliness of the motor vans, tools, and gear, attention has to be given to these matters during shift hours.

It is interesting to note that Mr. Roberts has an "all in" water heating charge somewhat on the Tottenham lines; 6d. or 7d. per day may I think be regarded as a reasonable charge for a service of this kind.

Replying to Mr. P. E. Browne, commission is confined to district representatives who actually canvass for business. No commission is paid on orders which emanate from enquiry or correspondence, nor do showroom attendants receive it. It is hoped, however, that the scheme may ultimately be extended to include other members of the sales staff.

With regard to building development, every effort is made to install apparatus to points arranged for with builders; under the scheme names and addresses of purchasers come into the hands of the Building Development Section and are at once followed up by an accredited representative who does his best to persuade new consumers to adopt an appliance for each point. A large percentage of the points put in by builders are utilized by new tenants at the time of occupation and if not then, certainly at a later date when a canvass is made. An existing point is an inducement to the consumer to adopt an appliance and the 5 per cent. discount is also helpful in this respect.

Flueless Rooms.

Some few houses are being erected with rooms where no flues are provided; no subsidy is paid on any points which may be put into these rooms. The 5s. paid for lighting point is for exclusive gas lighting. The £3 payment per house (which is a "contribution towards the cost of affording a supply of gas") does not include for any internal pipework, this being done either by the Company or paid for under the subsidy scheme. In practically all cases the £3 charge is the one agreed to by the builder.

The setting back of coin meters, which are all of the inclusive slot type, does of course involve a smaller quantity of gas being supplied per coin and it is conceivable that were a consumer to adopt the whole range of option appliances, the reduction in quantity—*i.e.*, 5 cu.ft.—would be very appreciably felt; in fact he would only receive 12 cu.ft. per penny. On the other hand, service and efficiency are much improved. The scheme gives the consumer an opportunity of acquiring up-to-date appliances, which is all to the good and no transaction of this kind would be allowed to go through until the position had been

clearly explained to the consumer. There are many cases where two "option" appliances are installed on these terms.

In dealing with the industrial aspect Mr. H. R. Hems refers to the passing on of information consequent upon removal of factory premises from the area of one undertaking to another. If only from the point of view of the large potential output which consumers of this class represent, it is most important that the services rendered by an undertaking should be continued by the new suppliers when premises are transferred to another part of the country. In these cases it would be of advantage if information of removal, details of apparatus, and terms of supply were made available and communication instituted between departments dealing with industrial matters so that continuity of service might be maintained. The data would be of great value and, properly applied, produce satisfactory results. One can sympathize with Mr. Hems in his views upon prices. Uniformity is not at present possible (nor perhaps will it ever come), and in comparing gas with other forms of fuel energy which are almost uniform in price, one is faced with difficulty. The path of the industrial salesman would be comparatively easy were standardization of price made possible in the Gas Industry.

Colonel W. M. Carr very rightly points out the dangers of publishing comparative costs, while at the same time he pays tribute to their usefulness as a guide. Such costs, of course, will differ in consequence of the circumstances of each case and one must agree with him as to the caution to be observed in using data of this kind. On the other hand, information can be of considerable value as indicating the price at which gas would have an opportunity of competing. Certainly for night loads, such as bread baking, as mentioned by Mr. C. H. Chester who has been very successful in this direction, low prices are imperative and the special tariff mentioned by him would seem to have potentialities. The Gas Industry must more and more recognize the vast night load awaiting it as soon as competitive prices are available.

Demonstration Houses.

Colonel Carr refers to demonstration houses on building estates and suggests the purchase of premises which shall be equipped with gas apparatus and sold when no longer required. My Company has not yet embarked upon a scheme of this kind. At present there are 26 show houses on the area some of which are completely furnished, others which contain gas appliances only.

It is interesting to note that Mr. W. J. Sandeman is giving special attention to cooking and home washing loads. It is in this direction particularly that electrical competition will, in my view, be felt. We in Tottenham are doing quite a lot of work in this way and a Women's Advisory Section is continually making contact with lady consumers, advising upon the use of cookers, washing machines, coppers, and irons, carrying out cooking operations in consumers' homes and, of course, demonstrating in showrooms and public halls. Demonstrations are undoubtedly the most effective way of advertising gas for cooking and washing and certainly pay for the labour involved.

Mr. Sandeman concurs with the views expressed regarding personnel and the value of skilled salesmen and saleswomen. The sales employees engaged by my Company spend a short time in the assembly shops in order that they may become conversant with the appliances they have to sell and thus be in a position to discuss intelligently their merits and advantages with consumers.

No commission is paid for exchanges of rental appliances nor upon installations of "free" types of apparatus. A modified commission scheme is applied to fitters, meter inspectors, and coin meter collectors, who receive approximately half the standard rates paid to district representatives when enquiries brought in by them lead to installation of appliances. The success of this arrangement may be gauged by the fact that during 1934 the number of enquiries so dealt with was 4,812 of which 28 per cent. were completed, appliances being installed upon calls being made by the district inspectors.

Regarding standard charges, although not specifically referred to, these are in operation in connection with the sale of apparatus, all prices including fixing. The business of the sales attendant is greatly facilitated by the ability to quote an exact price. Schedule charges for fixing own and rental apparatus are also in force and an attendant is thus able to give this information for most of the work required by the consumer.

With regard to switches, I note that Mr. Sandeman is not in favour of the catalytic type of gas igniter which in certain circumstances, I agree, may be somewhat unreliable. Experience, however, with a large number of Newbridge ignition switches proves that they can be quite reliable in use. It is, of course, necessary for care to be exercised in fitting the igniter in correct relation to the mantle and to see that the right design of igniter is employed, two types of which are available. The company manufacturing this type of switch has supplied many thousands which in my considered opinion can be recommended under certain conditions in preference to the pilot ignition type, notwithstanding the somewhat higher cost. I also think that something might be done to improve the life of the battery and I know that attention is being given to this point by the makers of this particular switch. The pneumatic type is, of course, very convenient, but its usefulness is somewhat impaired by trouble one is likely to get from failure of the by-pass. For general domestic use, however, I think the by-pass switch might be preferred on account of the lower initial cost.

Mr. Sandeman holds the view that it is not helping the sale of gas to be continually harping on its cheapness. While this is a most important aspect and one to which a consumer undoubtedly does attach great importance, reliability and efficiency must be stressed, and those whose business it is to further the cause of gas will not lose sight of the desirability of emphasis being laid upon these two matters.

Waste Heat Recovery

FROM RETORT SETTINGS

By Major W. GREGSON,

M.Sc., M.Inst.C.E., M.I.Mech.E.,

Technical Director of Spencer-Bonecourt, Ltd.

Major W. GREGSON, replying to the Discussion, wrote: I thank Mr. Birks for his contribution. He has had an almost unequalled opportunity of studying the operation of waste heat boilers on various types of retort settings. I agree the figures for excess air given by Mr. Birks as being typical for the Gas Light and Coke Company's installations, but hardly think they represent more general practice. The fact that the Gas Light and Coke Company looks upon the bench—rather than the individual setting—as a unit, owing to the size of their organization, greatly assists in keeping down excess air, as it is when a bench is working at partial load with some of the settings out of action that infiltration was most marked.

I regret that I omitted in error to refer to the fact that dry quenching of coke applied to intermittent chambers as well as to horizontals.

I believe Mr. Birks and I are in accord regarding the relationship of boiler diameters to steam release, but would also record that the condition of the feed—*i.e.*, degree of concentration present after treatment—exercises an important bearing on boiler priming, and has to be taken into account for each proposal, in addition to purely mathematical design figures. I have tried feeding at different points—top with spray and also with distributing tray; side (front, centre and back) and even at the bottom, and find that when the boiler is actually steaming and coupled up to the main—*i.e.*, operating with its natural circulation—the feed position makes very little difference.

I thank Colonel Carr for his remarks which are of particular value in view of the fact that Colonel Carr was one of the first Gas Engineers to apply waste heat boilers to regenerative horizontals. The waste heat recovery results at Stretford have been consistently excellent, due in a large measure to the steps which Colonel Carr takes as normal routine in his Works to prevent infiltration of cooling air and losses by radiation.

It was pleasing to hear Colonel Carr uphold the merits of induced draught when one remembers how difficult it was to convert many Gas Engineers to a belief in the purely mechanical effectiveness and reliability of induced draught, apart from the positive gain on setting control.

I agree Colonel Carr's recovery of 44 per cent. of the

total heat *ex* producers at Stretford, taking into account regenerators *plus* boilers, and this figure is a little higher than the *average* figures given in the table of test results as applying to verticals with boilers only. In actual practice, assuming the same radiation, &c., losses from the recovery system as a whole and the same final reject temperature to atmosphere, it follows that the recovery in thermal units by regeneration *plus* boiler, in the case of horizontals should be the same as for boilers *only* on verticals: it is, however, important to remember that in the case of the latter, *additional* recovery—over and above recovery on the flue gases—is effected by air preheating from other sources. As explained in the Paper, in differentiating between horizontal and vertical practice, this recovery effect must be added to the flue gas recovery figure.

The "Sinuflo" Boiler.

I listened with interest to Mr. P. St. G. Kirke's exposition of the merits claimed for his new "Sinuflo" boiler, compared with the straight fire tube boiler. The "Sinuflo" is a new design with—at the moment—little service experience behind it, and I feel that it is hardly within my province to criticize it. I would, however, remind members that to be effective over long periods of operation, Mr. Kirke's design must comply with every condition which practice and experience has shown to be essential.

Mr. Kirke asked for the mean gas speed applying to the experiment graphed on Plate 1. The mean speed was a little over 70 ft. per second, and increasing to 90 ft. per second reduced the total temperature drop through the tube by less than 2 per cent.

Mr. Kirke referred to the high speed of steam release on naval boilers: these cannot be compared on the same basis as applied to the waste heat boiler, as the conditions are entirely different. Apart from the pure feed—*i.e.*, entire lack of concentrates to cause frothing, &c.—the marine water tube boiler has its evaporation spread *evenly* over the whole water surface in the case of the tri-drum such as the Yarrow. In the case of the Babcock, the steam is separated in a chamber on the side of the drum and the bubbles do not rise through the drum water at all, as this water forms the surface of the downcomer section. With the firetube type of boiler under review, and incidentally also in Mr. Kirke's "Sinuflo" design, a heavy surge is present at the front and there is a vast difference between mean liberation and maximum liberation over (say) the first 2 ft. of the tubes. If members would inspect their boilers internally after a period of working, they would find the line of this surge up on the gusset stays at the front end, and this has to be allowed for in designing boilers of the firetube type.

Mr. Kirke enquired as to the methods of quantitatively separating radiant and convected heat absorption in boilers. Recent research by physicists such as Dr. Fishenden and Dr. Saunders has done much in this connection, and their work will be familiar to the Institution. My figures were based on actual experimental work carried out on varying arrangements of tube banks.

I thank Mr. D. L. Brown for his remarks on the Brighton installation, and agree with him as to the importance of small variations of inlet temperature on boilers operating at low inlet temperatures. I regret that I had to pass over the subject of make-up producer gas firing, but as pointed out in the Paper, it was necessary to keep within definite limits.

The question of corrosion of discharge stacks is due to low gas temperature carrying moisture depositions which in the presence of oxidized sulphur caused acid pitting. Experience has shown that where these stacks are not brick lined, a good form of protection is periodic painting with anti-acid paint, and care in draining away any tendency for acid-moisture to accumulate.

I am of opinion that the modern tendency to use more water or steam on producer grates, thereby increasing the saturation of the waste gases, has brought this potential source of trouble more to the forefront of late.

Finally, I thank Colonel Carr and Mr. Brown for their frank support in the one case for steam drive for fans and in the other for electric drive, which proves what I stated in my Paper—*i.e.*, that local conditions are the deciding factor.

The Preparation, Marketing, and Utilization of Coke

By W. L. BOON, M.I.Mech.E.,

Manager of the London and Counties Coke Association

Mr. S. B. CHANDLER (Tottenham) wrote: It may be thought by some that gas output is likely to be interfered with by the availability of solid smokeless fuel, in so far as its application, particularly to the domestic coke grate, is concerned. There must, however, always exist a number of people who prefer at least one solid fuel fire in the home, and from all points of view—*i.e.*, smokelessness, economy in running, ease of ignition, and other factors—evidence is not wanting of a very large field indeed for properly graded coke for this particular use, and undertakings which give proper attention to grading and quality are bound to reap a rich harvest.

The substitution of coke for gas in the domestic grate has, of course, to be considered, and undoubtedly there are cases where the former is preferred, particularly for extended use. I do not, however, think that substitution of one type for the other is a serious matter. How much better it is to be able to replace a gas fire which in any event is to be removed, by one which utilizes both gas and coke, rather than semi-coke or soft coal.

One must agree with Mr. Boon's remarks on the appearance of coke appliances and the fuel itself when exhibited in showrooms; samples of coke should often be changed, or better still, perhaps, placed in glass fronted cases (as is done at Tottenham).

An important point is raised where reference is made to space available for the household stock of fuel. It is really time that local councils should insist on adequate fuel space or bins and builders be encouraged to make proper provision for the more bulky storage. Engineers from the North would probably be surprised at the lack of space available for fuel in many of the smaller houses being built in the South to-day. This point is particularly important where a consumer is using a boiler and fires when two grades of coke have to be stored. Perhaps Mr. Boon could inform us whether it is possible for a special size of coke to be evolved which would serve the dual purpose. I know the inconvenience of having to stock two grades.

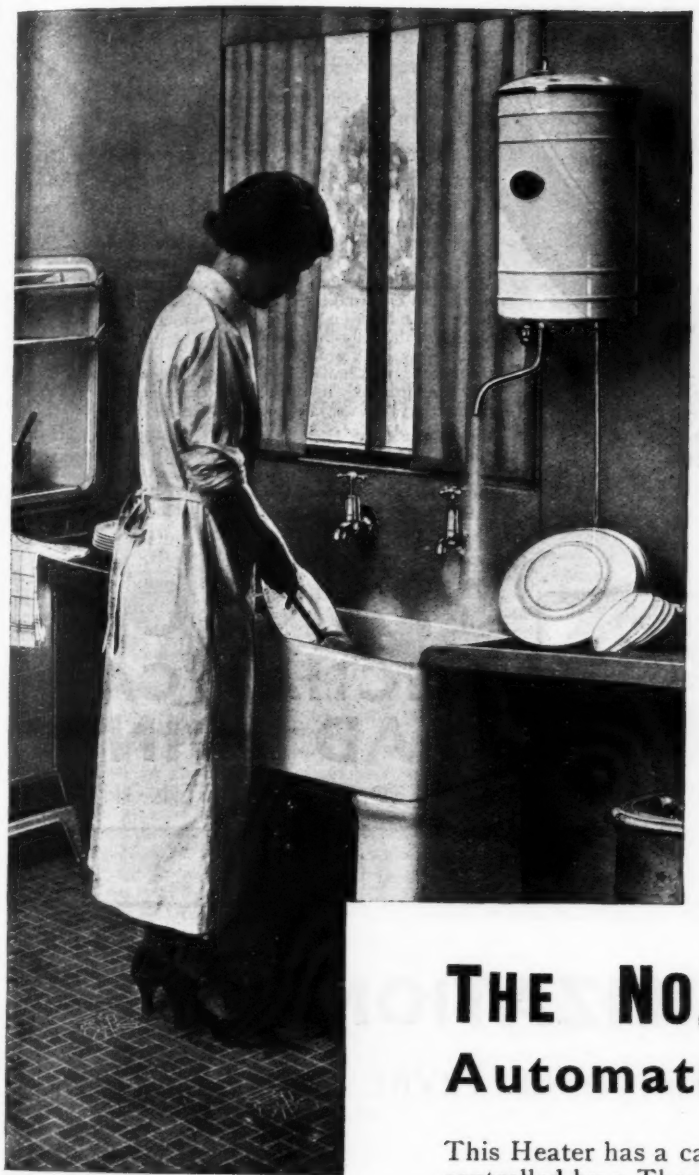
Reference is made to the low average annual coke consumption of the small domestic hot water boiler at 3 tons per annum. I believe it is even lower than this and suggest that 30-35 cwt. per annum is a better figure to take for small boilers. Possibly, however, Mr. Boon has information which confirms his statement.

The suggestion made as to the coupling up of the back-boiler with the gas system is to be commended; undoubtedly a plant of this kind has many advantages and one can anticipate much business being done in this way. From a coke-gas sales aspect this to my mind is the most interesting feature of the Paper.

When fixing coke grates, opportunity arises for the introduction of a portable gas heater which can be utilized during some part of the year when conditions of temperature do not warrant the use of the coke fire. By inserting a plug-in connection on the gas supply, it is quite easy to attach a portable heater. This is the practice in Tottenham; in cases where a consumer orders a portable heater when the coke fire is being installed, a special price is quoted and the fixing charge eliminated.

The London and Counties Coke Association are doing excellent work on behalf of the Industry, and their specifications and recommendations in connection with coke burning appliances are assisting in great measure to regularize what otherwise might be a somewhat confusing state of affairs particularly in view of the fact that manufacturers of boilers and fires seem to be an increasing quantity.

A number of excellent coke fires are on the market, but matters such as further improvement by way of ignition burners (whether they shall be atmospheric or luminous), shaking grates, general appearance, economy in mainten-



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ance and running costs, can, with advantage, still be investigated, and manufacturers will be wise to invite the co-operation of the Association and the larger gas undertakings in order to obtain sanction and approval.

Not a Waste Product.

Mr. A. H. Mills (Portsmouth) wrote: The popular opinion which has to be combated by the coke salesman that coke is a waste product—as is early mentioned in the Paper—is perhaps best discounted by the suitably emphasized statements that:

(i.) About 30 cwt. of coal go to the making of 20 cwt. of coke.

(ii.) Weight for weight, coke contains more heat units than gas.

(iii.) The Gas Industry sells nearly twice the heat units as coke than as gas.

The question "to quench or not to quench" is rather summarily decided by Mr. Boon in favour of the latter, but the modern quenching tower and bench can, I think, be worked to produce results as desirable as the rather anachronous spraying of dry cooled coke. I would also suggest that dry cooled coke from the type of plant as used at Ford's apparently suffers from the reversible reaction $2\,CO \rightleftarrows CO_2 + C$, the deposition of the amorphous C on the surface of the coke vitiating its appearance until it compares unfavourably with most quenched coke.

The performance of the dry cooling boiler indicated by the figures given is remarkable—in fact, it would appear that any economic success the system has is due to the abnormal specific heat of hot coke.

Mr. Boon's description of the technique of cutting and grading, which is still in its infancy, is very opportune and important. The costs of the operations as given in the tables agree very closely with our experience at Portsmouth. I am strongly of the opinion, however, that we should get away from the term "grade" as connoting quality rather than size, as intended.

With regard to breeze production for sale, this may be largely allied to steam production and use in Works and with the utilization of waste-heat boilers and the type of carbonizing plant. It is noteworthy that the extended use of power and electricity generation by steam plant on gas-works, even though waste-heat boilers are used in addition to breeze-fired boilers, has in some cases solved the breeze accumulation problem.

Intensive marketing of coke, it seems to me, would result in the demand far outstripping the supply. Even should furnace coke further enter the fuel market, the comparatively small inroads coke has made in the domestic and industrial fields, as set out in the Paper, still leave a very large potential demand. Of course, if gas by "grids" and other means can be sufficiently popularized, the coke supply might be correspondingly increased and satisfy the demand.

The striking figures of Table 6, relative to the increasing demand for the different sizes of coke, are more than substantiated by our experience at Portsmouth, where sales of sized coke have reached 65% of the total since 1930. In fact, I think size has a greater effect than quality.

Stretford Tests.

Mr. James Carr (Stretford) wrote: The figures of the requirements of the coke distributed in our industrial and residential area are interesting when compared with those of the London area given in Mr. Boon's Paper. The sales in the Stretford area are divided approximately in the following proportions:

	Per Cent.
Breeze—Industrial market	13
Smithy nuts—Industrial market	1
Domestic nuts—Open fires and small hot water units	8
Broken coke—Industrial, bakery, large central heating units, &c.	43
Large coke—All industrial	35
	100

I was particularly interested in the tests in Section V., having recently carried out a series of tests on various coke fired grates as compared with coal fired grates. My tests were carried out with the same room and flue conditions in all cases, and the outside temperatures were reasonably comparable. The coke fired grate of which test is given was the most efficient of those tested.

Fuel Tests on Coal and Gas Coke Grates.

Coke Fired Grate.

Coke used: 72·4 lb.	Time burning: 31 hr. 10 min.	Av. room temp.: 67° F.

Average per 12-hour day.

Coke used: 27·84 lb.	Gas used: 17·47 cu ft.	Av. time to ignite: 18·3 min.

Coal Fired Grate.

Coal used: 154·5 lb.	Time burning: 47 hr. 11 min.	Av. room temp.: 63° F.

Average per 12-hour day.

Coal used: 39·36 lb.	Gas used: 8·9 cu.ft.	Av. time to ignite: 9 min.

Taking coke at 1s. 6d. per cwt., the average price received in Stretford, and coal at 1s. 9d. per cwt., the ruling district price for ordinary grade house coal, the comparative cost of coal and coke work out as follows:

Coke	4·621 pence per 12-hour day
Coal	7·360 " " " "

The National Specification.

Mr. H. J. Hodsman (Leeds University) wrote: I am hesitant about the advantage of national specifications for cokes. Coke is made from a natural raw material, varying widely in composition and character, carbonized in very varied plant. The product must therefore show variation in properties. The task of drafting a national specification for coke might be compared with that of drafting one for wine. This, however, does not preclude the definition of tests calculated to expose the characteristics of cokes and from which the behaviour in use could be largely anticipated. The grounds for this have already formed the subject of a communication by myself and collaborators (Communication No. 80) to the Institution.

It would certainly be advantageous to secure some degree of uniformity in the method of defining or measuring the character of a coke. Proposals to adopt a single chemical test for this purpose are attractive, but should be received with caution. The behaviour of a coke in use is determined by the interplay of its chemical and physical properties, which may not be measured in this way. Such a test might discriminate unjustly against some types of gas coke which are successfully used in practice. Moreover, a test made on small particles cannot give proper weight to those properties of a coke which depend on the form, size, and structure of lumps. If a single test were adopted, it would for this reason preferably be a fire test. Mr. Boon's advocacy of a uniformity of grading and description is one which should receive every support.

Mr. D. K. Clarke (London) wrote: Mr. Boon's Paper is to be welcomed not only for the practical proposals which he formulates but also for the interesting statistics, some hitherto unpublished, which he gives. Among the most interesting of these statistics are the figures showing the proportions of coke sold in London and the Home Counties for different purposes. There are certain other figures of coke consumption published which are possibly not generally known to the Gas Industry but which should be of some interest to them in showing the general background against which any marketing arrangements among themselves or with oven interests must take place.

The table on the following page shows for recent years the sales of coke under various headings.

These figures of "total other sales" include additions to and deductions from stocks at ovens and in merchants' hands and also a small quantity (about 250,000 tons in 1930 and half that amount in 1924) used at the coke ovens. On published evidence it is impossible to say what changes in stocks have taken place. At all events, there is evidence of an upward trend in home sales, but, with due regard to the economic circumstances of recent years, it cannot yet be said that exports have been "curtailed in favour of the home markets" for the country as a whole, although that may be true of the London area. These figures do, however, bring out the fact that the supply of oven coke outside the blast-furnace market is largely dictated by the needs of that market so that the available supply is likely to be greatest when the steel industry is most depressed.

The second series of figures is probably less well-known to the Gas Industry. They are taken from the Reports on the Census of Production held in 1924 and 1930. The estimated sales of coke to Industry were 13,243,000 tons in 1924 and 11,151,800 tons in 1930. Of these amounts 9,500,000 tons in 1924 and 8,200,000 tons in 1930 were sold to blast furnaces, steel works and iron foundries, leaving about 3,700,000 tons in 1924 and 3,000,000 tons in 1930 sold to other industries. By using the figures of total sales given in these Reports and of exports given in the Annual Reports of the Mines Department it can be found that domestic and commercial consumption was about 4,600,000 tons in 1924 and 5,700,000 tons in 1930. If, on the other hand, figures for sales and exports are taken from the Annual Reports of the Mines Department, these two figures become 4,000,000 tons and 6,200,000 tons respectively. The difference between the results of these two methods is attributable to the fact that the Census of Production returns do not relate to a calendar year but are made by

Sales of Coke (Million Tons).

Year.	Oven Coke (*d*).				Gas Coke and Breeze.			Total Other Sales.
	Total Output. (*a*).	Net Exports. (*a*).	Blast Furnaces. (*b*).	Other Sales.	Total Sales. (*a*).	Net Exports. (*a*).	Other Sales.	
1	2	3	4	5	6	7	8	9
1922	9·0	1·6	5·8	1·6	7·7	0·9	6·8	8·4
1923	13·4	2·7	8·6	2·1	7·5	1·2	6·3	8·4
1924	12·8	1·8	8·6	2·4	7·4	1·0	6·4	8·8
1925	11·0	1·2(*c*)	7·5	2·3	7·4	0·9	6·5	8·8
1926	4·7	0·1	3·0	1·8	7·0	0·3	6·7	8·5
1927	11·8	0·8	8·4	2·6	7·6	1·0	6·6	9·2
1928	11·8	1·6	7·7	2·5	7·7	1·0	6·7	9·2
1929	13·4	1·7	9·0	2·7	8·0	1·2	6·8	9·5
1930	11·5	1·5	7·4	2·6	7·9	0·9	7·0	9·6
1931	8·5	1·4	4·6	2·5	7·7	1·0	6·7	9·2
1932	8·5	1·4	4·3	2·8	7·4	0·9	6·5	9·3
1933	8·8	1·5	4·8	2·5	7·6	0·8	6·8	9·3

(*a*) Mines Department Annual Reports.
(*b*) British Iron and Steel Federation.
(*c*) Net imports.
(*d*) In addition, approximately 0·5 million tons of breeze are produced each year.

each firm at the end of its accounting period within certain specified limits. The former are the more reliable figures for comparative purposes.

Industrial consumption (without blast-furnaces but including other iron and steel works) was approximately 4,600,000 tons in 1924 and 3,700,000 tons in 1930, compared with available supplies of about 8,700,000 and 9,400,000 tons respectively. If Mr. Boon's figure of 14 per cent. is used for the proportion of home sales of gas coke sold to industry for the whole country for 1930, the total will be about 980,000 tons, leaving 2,700,000 tons to be supplied for industrial purposes from coke ovens. This is about equivalent to the whole supply surplus to the demands of blast-furnaces. On the other hand, it seems equally possible that the greater part of the 1,500,000 tons of furnace coke brought to London is used for domestic and commercial purposes. On balance, therefore, it seems probable that the industrial sales of gas coke are rather more than 15 per cent. and perhaps 20 per cent. of the home sales for the whole country.

Of the total decline of 900,000 tons which took place between 1924 and 1930 in industrial consumption (without blast-furnaces) nearly two-thirds was attributable to industries other than iron and steel. The cement, brick, and fireclay industries were responsible for a decline of nearly 300,000 tons and mechanical engineering and vehicles for 370,000 tons. On the other hand, consumption at collieries, electricity supply works, and chemical works was doubled—an increase of 400,000 tons. Were such figures available, it would be interesting to compare these changes with changes in the supply of gas to these industries, since changes of this magnitude clearly reflect the displacement of coke by another fuel rather than normal industrial fluctuations.

Did the time and space which can be allotted to this contribution permit, an approximate estimate of the total industrial consumption in each year could be made. As it is, unless the Industry itself collects similar figures, it will be necessary to wait until about 1938 for figures relating to 1935 to be available on a similar basis. There is, however, food for thought in the figures already available.

These figures show that coke has been displaced in some industries by other fuels and that in the industrial market supplies from coke ovens hold the predominating position. Moreover, larger supplies from this source are likely to become available during a depression in the steel industry, and a depression in this industry usually signifies a depression in most other industries. The total coke available outside blast-furnaces for sale was higher in 1932 than it was in 1928; yet industrial activity was much less. It is also at such times that it is hardest to induce firms to undertake capital expenditure on new plant.

Certain further trends may be noted. First, there has recently been a tendency for new batteries of coke ovens to be built in conjunction with steel works. In so far as this new capacity is in substitution for old, the effect may actually be beneficial to the Gas Industry, because these ovens are likely to be operated only when the steel works are also in operation, so that in a depression the output of coke will decline with the output of pig iron. In so far as old capacity continues in production, competition in coke sales will be strengthened. Secondly, the import duties on iron and steel products and the adherence of this country to the international cartel is likely to give our iron and steel industry greater stability during a future depression. It is possible that this may reduce the fluctuation in supplies of oven coke to other consumers and so react to the advantage of the Gas Industry.

Finally it may be noted that in 1930 about 35,000,000 tons of coal were used for power production and 25,000,000 tons in industrial processes, so that the potential displacement of coal by other fuels is of almost as much importance in the industrial as it is in the domestic market. It is possible that much of the direct benefit of an extension of industrial consumption would inure to the producers of furnace coke, but the results would in the long run be beneficial to the Gas Industry also.

Every Product of Equal Importance.

Dr. G. E. FOXWELL (London) wrote: Mr. Boon's Paper is timely and a valuable contribution to the subject of further improving the economics of the gas-making process by getting more return from residuals. I do not really like the term "residuals." The proper way to regard the manufacture of gas is not to accept it as an article of faith that the Industry exists for the purpose of making and supplying gas and nothing but gas and that anything else is a by-product. Every product may be of equal importance if handled to the best advantage, though of course some must have a greater effect on the economics of the process than others. The Gas Industry is one phase of a larger industry that exists for the purpose of turning coal into products of more use to mankind than is the raw material. If that view be taken and each product be extracted, prepared, and marketed to the best advantage, the very best step will have been taken towards improving the Industry and cheapening the cost of manufacturing gas.

Mr. Boon shows that the requisite steps are being taken to deal with nearly half the coke produced. Since all the coke produced by the undertakings comprising the London and Counties Coke Association is being sold, it would be interesting to hear from Mr. Boon if he considers that a greater advertising and sales campaign would be of any value in his area. The crux of the matter appears to be that the Gas Industry is apt to be a little parochial, and nothing that I heard during the debate lessens that feeling. Gas coke is regarded as being the intimate concern of the Industry and as having no reference to what is happening elsewhere, whereas the whole future of gas coke does not depend on what the Gas Industry does about it, except to a minor extent.

That may seem a revolutionary idea, but the state of the coal and steel industry must be considered. The manufacture of blast furnace coke and the rise of the by-product coke oven only became possible because they formed an outlet for the slack coal; had the more expensive grades been used, the price of blast furnace coke would have been prohibitive and the coal blast furnace used in Scotland would have been developed in England also. To-day, as Mr. Boon points out, the blast furnaces are building their own coke ovens. Also, the colliery owners are finding that there is a demand for graded coal and that they are having to break the larger coal. The consequence is more slack and therefore a greater demand for means of up-grading that slack. Many steel companies now own their own collieries and the "unattached" colliery owner is likely to seek other outlets than blast furnace coke. The two obvious outlets are coke nuts and high-volatile open-grate coke—both of which can be made in the by-product coke oven that the colliery owner knows so well as an old and tried friend. There is a potential market of 40,000,000

tons; there is plenty of room for all, and there is also the export market.

Result of Propaganda Work.

What happens now is that the Gas Companies do a lot of propaganda work—and the coke ovens reap part of the benefit. The gas companies try to keep their price up, but as soon as the coke ovens find the coke market a bit slack they sell graded coke to the merchant, and he in turn drops the price of the oven coke, and gas coke must follow suit. So long as there is the competition of oven coke, so long must there be a leakage in the possible returns from gas coke. That portion of Mr. Boon's Paper dealing with price stabilization is most important. The competition from oven coke will increase. To-day we sell: gas coke $7\frac{1}{2}$ Mn. tons—oven coke nuts $2\frac{1}{2}$ Mn. tons. The output of gas coke is governed by the output of gas, but the output of oven coke is not so limited. Within ten years the positions may have changed from $7\frac{1}{2}$: $2\frac{1}{2}$ to 10 : 20. What will be the position of gas coke then? The price will have dropped enormously, and the effect upon the sale price of gas cannot be neglected.

If Mr. Boon's Paper means anything, it means that with a proper sales effort the 40 Mn. tons of coal now used for domestic heating can be distributed between gas and coke, with a few crumbs for electricity. A proper sales effort can only be secured by united effort between all coke producers. That in turn means that the oven coke people and the Gas Industry should get together and market their coke through a central organization. I would invite Mr. Boon to state if he looks upon this proposal favourably and what benefits he considers would result in the event of such an arrangement being made. If his reply is what I expect it will be, it is surely up to the Gas Industry to see whether a move cannot be made in this direction.

Amid the mass of interesting technical points that could be discussed, I will confine myself to two. I am doubtful whether the coke should be handled as carefully as Mr. Boon suggests in the earlier stages of manufacture. The important point is the condition in which it arrives at the consumer's premises, and surely any breakage that can take place due to cracks would occur before the final screening.

The second point is the utilization of breeze. I feel that heated screens should be developed to remove the dust coke below, say, $\frac{1}{8}$ in. This coke is of no use in producers, whether mechanical or otherwise, and cannot be of great use in a boiler. If this coke, which seems to comprise perhaps 15 per cent. of the total coke made when all the coke is cut, were scientifically re-mixed with the coal before coking, the quality of most cokes would be improved, the rate of carbonization would be materially increased, and the small coke would be up-graded in price from a very small figure, which for courtesy may be put at 5s. per ton, to the price secured for the best large coke, say, 20s. or 30s. In addition, the removal of this fine material would allow practically all the breeze to be burned in the producers, with immense financial advantage which only those who have calculated the result will fully appreciate.

THE AUTHOR'S REPLY.

Mr. W. L. Boon, replying to the Discussion and Written Contributions, wrote: I am particularly gratified to have Mr. R. J. Restall's views on the marketing of his coke, and to learn of the concrete result in the form of added revenue which has directly taken place as a consequence of grading his fuel, enabling it to be sold into more remunerative markets.

With regard to the relative combustibility of dry quenched and wet quenched coke, laboratory tests indicate that while in small fractions the capacity for reaction of dry quenched coke seems to be slightly inferior to that of wet quenched coke, the difference becomes less in the larger fractions, disappearing almost entirely with sizes between $\frac{1}{8}$ and $\frac{3}{4}$ in., and practically non-existent in the market grades.

Generally it may be stated that the ignitibility of coke depends more on the composition of the coal carbonized, the temperature of carbonization and the volatile content of the coke, than upon the method of dry cooling which does not affect it to any practical extent.

This is fully borne out by the following table (Table 11 in Mr. R. E. Gibson's Paper read before the National Smoke Abatement Society on September 19th, 1931) showing a comparison between "Dryco," a good domestic coal, a well known low temperature fuel and vertical gas coke. ("Dryco" is a domestic coke produced and dry quenched at Eccles Street Gas Works, Liverpool. It is made from suitably blended coal and contains an average of 2 per cent. of volatile matter.) In this table, as a measure of ignition, the quantity of gas required to light the fuel is given and it will be seen that "Dryco" ignites nearly as well as low temperature fuel and much better than vertical coke.

Table II.

Fuel.	Gas Required to Light.	Maximum Radiation During First 2 Hours.	Time Taken to Reach Maximum Radiation.	Average Radiation Over Whole Period of Test.	Ash and Fuel Remaining After Fire had Gone Out.
1	2	3	4	5	6
	Cu.Ft.	Galv. Rdg.	Minutes.	Galv. Rdg.	Per Cent.
"Dryco" . .	4	105·0	75	93·5	10·2
Low temperature fuel	3	82·6	75	81·1	9·9
Coal	2	63·6	120	66·1	11·7
Vertical coke .	6	87·0	120	62·0	12·1

With regard to the handling of coke, Mr. Restall suggested that it would be better if the coke were of a hardness sufficient to withstand rough treatment. It is my view that even if the coke is harder it would be a paying proposition still to handle it in as gentle a manner as possible, providing always that the cost of so doing is not excessive. The breeze production from a harder coke would certainly be less, but if rough handling took place, then degradation might conceivably assume proportions of a material character.

With regard to the ash content of coke, I entirely agree that modern requirements demand a better figure than an 8 per cent. ash content, and while I have quoted the figure of 8 per cent. I did so as a maximum, and in the hope that we should not exceed it, but always aim at a reduction on this figure.

The cost of handling, which includes stocking, cutting, screening, and bag filling, is returned by Mr. Restall at 22·86 pence per ton for his Works, which is an exceedingly good figure, and is comparable with Works of a more modern character. But it must be remembered that the labour charges which form a large proportion of this total are of a fluctuating character in accordance with geographic position, and I should anticipate that London costs would be higher than those at Stalybridge.

It is interesting to note the increment in sales of graded coke as opposed to ungraded coke in the Stalybridge area, and while the increase is not so material as in some of the London areas, it is nevertheless conspicuous in showing conclusively the necessity and value of grading.

With reference to Table 10, which deals with tests carried out on a 28 ft. Lancashire boiler with coke and various coals, Mr. Restall is quite correct in assuming that the fuels are priced out on a comparative basis, and based on the experience of many boiler tests, the equivalent cost of gas coke to do the same duty as a boiler slack at 16s. would be 20s. That is if the grate loading is of a character suitable to coke. In other words, the efficient use of coke on industrial boilers depends very largely on the output required from the boiler, and the amount of fuel which must be consumed per sq. ft. of grate area per hour.

If the grate loading when using coke does not exceed 20 lb. per sq. ft. then a consistently higher efficiency can be obtained. If, however, the grate loading under natural draught conditions is in excess of this amount, then the efficiency is reduced and the use of coke may not, as a consequence, be economic, or able to carry the load.

A boiler test more recently carried out than that detailed on Table 10, between a good quality slack coal at 24s. and unbroken coke at 30s. showed exactly equivalent work. In other words, the cost of steam production per 1,000 lb. was exactly the same, the higher price of coke being balanced by the higher efficiency obtained. This applies only to hand-fired boilers with natural draught.

Nomenclature.

Concerning nomenclature, I notice that Mr. Restall refers to this as a vexed question, but I believe that without very great inconvenience a considerable improvement could take place. Personally, I should like to see the word "grade" eliminated, because in the public mind "grade" is compatible with "quality" as in the case of milk, and the public imagine that Grade 1 refers to quality in that sense, whereas it refers to size only.

Nevertheless, a considerable advance has been made in the area of the London and Counties Coke Association by the adoption of the sizes given in section III. (13), and if it could be anticipated that these standards would be more generally adopted, a very great advance would be made.

Mr. F. W. J. Belton's views are of a controversial character, as I think he intended they should be. He ostensibly prefers to provide a coke which shall be sufficiently reactive to permit its use in any existing grate, rather than sponsor the use of special grates, but this means that Mr.

Belton is content to forego some of his gas yield in order to produce a coke with a volatile content of some 3½ per cent.

Mr. Belton will have decided what the economics of the case are, and I presume he would not embark upon a development of this character without being satisfied that he was not losing money in the process. The conditions in New Zealand may, for some particular reason, justify such a policy, but I feel confident that the London Gas Companies are satisfied that the method now being adopted, of installing special appliances and using fully carbonized coke in those appliances, rather than foregoing any of the gas yield, is the better and more profitable scheme.

The new grates as I have endeavoured to show represent a very good purchase to the client, and while their instalment requires a greater sales effort, the ultimate result is better, inasmuch as the client is probably more wedded to the use of coke than he would be in Mr. Belton's case.

Replying to the remarks made by Mr. Belton with regard to the cost of steam raised by dry quenching, on the basis of Table 1, the reduction in the saleable weight of coke over ¾ in. in the case of dry quenched coke (taking the mean of the two dry quenched samples) which is due to the absence of moisture, amounts to about 9 per cent.

If the price obtainable per ton of coke at the Works is 4s. 6d. this reduction represents about 4·9 pence per ton of coke. As each ton of coke cooled produces about 1,000 lb. of steam, the above reduction also represents about 4·9 pence per 1,000 lb. of steam, not 4s.

It will be noted that in Table 1 the dry quenched coke is left completely dry and therefore, if the coke is slightly damped for the purpose of laying the dust, the difference would become smaller.

An important fact, however, seems to have been overlooked by Mr. Belton—viz., that the fines in the case of the wet quenched coke are of very low value and in many cases practically useless, whereas in the case of dry quenched coke, the breeze, being dry, is a useful fuel. This more than compensates for the above loss.

If the cost of steam has to be, as Mr. Belton states, doubled on account of higher cost of installation in New Zealand, this would equally well apply to any other steam raising plant, so that the economy of the dry quenching process would not appear to be affected.

The Merchant.

With regard to the distributive trade and the function of the merchant, Mr. Belton pointed out that the merchant is not unbiased and is ruled primarily by the sale of whatever fuel will give him the largest gross return. It is not this view that I desired to bring out, but the fact that the user of fuel looks upon the merchant as a man having less biased views because he has a variety of products to offer, none of which he manufactures. On the other hand, the producer of coke has one product only to sell, and it is, of course, the user's decision which has to be primarily considered.

Mr. Belton's views on advertising are helpful, and his method of distributing samples of coke in paper bags containing a leaflet as to its merits is the very best form of advertising. Such a method can be used, however, only locally, and it has been, and is being, practised in various parts of this country, in all cases with good results. But this does not obviate the need for a wider campaign of a national character, as is instanced by the recent advertising campaign which has been undertaken for the use of coal, and it might surely be argued that everybody knows about coal, and yet we have ample evidence in published figures that the campaign and money expended by the Coal Utilization Council has been well justified.

Mr. Belton's views regarding the potential increase in production of coke are most interesting, and I had certainly never visualized that the Gas Industry could economically and with the same make of gas produce such an increased quantity of coke as Mr. Belton suggests. I hope that he may find time to tell us more about this in due course.

I was glad that Mr. W. W. Townsend dealt with the question of coke storage, and I endorse his view that the storing of only graded coke does offer definite advantages, not only from the fact of reduction in breeze loss, but space conservation, and also ensuring a reserve to draw upon when the peak demand is made.

As to the working of the London and Counties Coke Association, Mr. Townsend's remarks are timely, pointing out as he does that a great deal of the work which had been achieved would have been impossible had not members pooled their experience and their knowledge to the greater benefit of the Industry as a whole.

A great deal of information has become available by this interchange of views and experiences, and the development of the technical services of the Association has been built up by this means and with the primary object of assisting the use of coke to get the best work out of that fuel.

Wet and Dry Quenching.

Mr. R. N. Webb's references to shatter tests between water quenched and dry cooled coke are interesting, and I agree that under favourable conditions the percentage of difference between the size of coke for either wet quenched or dry cooled coke need not be greater than 2 per cent. The conditions, however, governing the wet quenching of coke were so varied that while it is perfectly possible to achieve the conditions outlined by Mr. Webb, it is not likely that they would be representative, but only applicable in cases where wet quenching conditions were very carefully dealt with.

The same remarks apply to the quantity of water used for wet quenching. I was not referring to coke oven plants in this connection, but to gas undertakings. It is quite true that the quantity of water used for quenching is very frequently of a more reasonable order, but the fact does remain that quenching in many gas undertakings is not undertaken by any method which ensures a uniform and minimum quantity of water being used.

With dry cooled coke, on the other hand, the conditions and therefore results are stable; that is, what we are aiming at with regard to coke. It is the difference in quality between one delivery and another which is probably the greatest bugbear in marketing, and any method which can be economically applied in order to achieve uniformity is justified.

I have agreed elsewhere that a perfectly dry coke was not advisable; on the other hand, I am not doubtful as to the efficacy of spraying the coke at discharge after dry cooling.

With regard to breeze production, I note Mr. Webb gives his figures as 24 per cent. of the total as against 35 per cent. returned in my tables. I am glad to note this reduction; at the same time it will be found that the higher figure is more universal for various reasons, and I agree that this seems excessive and could be reduced by better means of handling, quenching, and storing. In fact, gas undertakings as a rule have not looked upon coke with the respect which it ought to receive, either during its production or its ultimate selling.

I am particularly interested to note that Mr. Webb's undertaking sold during last year over 5,000 tons more coke than in any three preceding years, which he attributes to the fact that it is cleaner and graded to sizes suitable for its various uses. This statement adequately confirms my views, and suggests that my paper was developed in the right direction.

It is gratifying that Dr. F. M. H. Taylor had an opportunity of contributing to this discussion, as his Company has played a very important part in the development of new methods for the utilization of coke and in the modernizing of coke-burning appliances, which have been of great benefit to the Industry as a whole. The gravity feed boiler particularly has put an entirely new complexion on the central heating work of large buildings, and the question of automatic control and the servicing of "all in" contracts were matters for which Dr. Taylor and the Gas Light and Coke Company had been largely responsible.

All their information and the results of the work of their laboratories had been freely placed at the disposal of the Association for the benefit of all its members.

Mr. S. B. Chandler's observations on the open coke fire in the home are, I think, opportune, and being based as they are upon actual experience in a large district, and coming essentially from an engineer primarily concerned with gas, they become all the more valuable.

I am glad that Mr. Chandler supports the fact that a substitution of a coke grate in place of a gas fire is so rare that it does not constitute a situation of a serious character. As I have stated the figures which have been so carefully compiled show that in no case more than 16 per cent. of replacements of coke fires for gas fires could ever be discovered, normally the figure is 6 per cent., so that in either case the increment in gas load for the gas lighting of the coke grate is greater than that lost in the displacement of gas fires.

I am pleased to learn that Mr. Chandler also attached importance to the exhibition of coke samples in showrooms, and if the method of putting the coke samples in glass cases, as is done at Tottenham, could be more frequently followed I think that it would have beneficial effect.

Storage Space.

With regard to the lack of storage space for solid fuels in modern housing estates in the London area, I agree that this is a particularly important point which has not been given the attention which it deserves by local authorities.

In housing estates, of the speculative type, there is no authority which requires the builder to provide the space which we would like to see allocated for this purpose.

Mr. Chandler points out that the consumer may require to carry two grades of fuel which are best suited to his appliances, but owing to the storage space at his disposal it becomes a difficult matter to do this, and consequently it would be of advantage if only one size of fuel could be stocked.

I would not advocate resorting to this means unless absolutely essential, but if it is necessary that only one quality of fuel should be used, then I would prefer to deliver the largest size suitable for the open grate, and request that the client should break down a small amount of coke for night use in his domestic boiler, otherwise the larger grade would not maintain ignition throughout the night.

With reference to the coke consumption of the domestic hot water boiler, the figure of three tons per annum I have given is based upon an all-round average, and is as nearly correct as some years of experience and tabulated figures have been able to give us. On the other hand, the tendency in the smaller property to-day is to use domestic boilers of very small size, and it would be true to say that the annual consumption under such circumstances might be as low as 35 cwt. If the use of the very small boiler persisted then the assessment of three tons per annum would become too high.

I note that Mr. Chandler looks with favour upon the suggestion of using a back boiler with a coke fire and a gas combination system to work in conjunction with it. This method of using coke as the major producer of hot water and topping up with a gas system appeals to me as a means of getting gas in for the small household, where an all-gas heating system would be prohibitive. Further, the use of a gas heater in conjunction with a domestic boiler offers a very real avenue for gas development, and at the same time does not present any menace to the sales of coke, but, in fact, provides a more flexible and convenient system for the householder than could be provided by a solely coke system.

I am grateful to Mr. A. H. Mills for his contribution and in bringing forward the additional argument for the coke salesmen to combat the very common view that coke is a waste product.

With regard to wet quenching as opposed to dry cooling, my object was not summarily to dispense with wet quenching in favour of dry cooling, but to focus attention on the possibility of dry cooling and to some of the evils consequent upon wet quenching, and in Mr. Mills' view I have apparently succeeded in doing this.

Mr. Mills compares the appearance of dry cooled coke unfavourably with that wet quenched, and gives a reason which is hypothetical but may conceivably be true; at the same time it is not borne out in practice by those undertakings who have had experience with dry cooled coke. As an instance of this, I would refer Mr. Mills to the paragraph dealing with this matter under my reply to Mr. Restall.

With regard to the term "grade" in relation to coke quality, I agree with Mr. Mills entirely and would refer him to my remarks in answer to Mr. Restall's remarks.

It is interesting to note that the experience of Portsmouth with the graded sizes of coke has shown an increase of sales reaching 65 per cent. of the total since 1930. I do not agree that size has always a greater effect than quality, I should think that both are equally important, and it would be very difficult to assess where the greatest benefit would lie.

With regard to the marketing of coke, we have a long way to go before the demand will outstrip the supply. I agree that this might be the ultimate result, but it would be dangerous to consider that we are immediately facing such a position and thereby reduce our efforts for developing and exploiting new markets.

Mr. Belton suggested in his discussion that the Gas Industry if necessary could supply 20 million tons of coke as against the 7½ to 8 millions of coke which it now produces. I leave this to Mr. Mills to think about in the same way that Mr. Belton left it.

The figures of coke distribution given by Mr. J. Carr for the Stretford area are interesting, and without having a full knowledge of the conditions, I would suggest that the domestic market (which only represents 8 per cent. of the output), being the most lucrative, should be catered for in preference to the industrial. In the London area, the domestic market is the highest consumer, and I should consider it good policy to cater insistently for increments in the domestic coke consumption and to reduce the large coke or broken coke in the industrial sections.

Without knowing the district intimately, I understand that Stretford has a large residential area of a character where domestic boilers and open coke fires might find a ready market. In this connection I notice the interest which Mr. Carr is taking in the coke grate and the tests which he gives are very timely, showing as they do the economic advantages of using coke in the open fireplace.

The difference in operating cost per 12-hour day between 4·62 pence with a coke fire and 7·36 pence for a coal fire would mean that the cost of a new grate suitable for burning coke would be paid for within the first year of operation, apart from its benefits of smokelessness, greater cleanliness in the house, and the saving of labour.

I appreciate Mr. Carr having submitted these figures which materially add to the information on the use of coke in the open fire.

National Specification.

Mr. H. J. Hodsman's views regarding the question of a national specification for coke are of exceeding value, coming as they do from such an authority on this subject. I must agree that there are many difficulties in the way of such a specification being formulated, and the reservations which must of necessity accompany such an attempt might render it inoperative.

Mr. Hodsman, however, does not rule out the possibility of drafting some method which would be calculated to expose the characteristics of coke from which its behaviour in use could be largely anticipated. If some degree of uniformity in measuring or defining the character of coke could be achieved, then a great step forward will have been made which would be of considerable assistance to the Industry as a whole.

This matter, however, is one which Mr. Hodsman is far better qualified to deal with than I am, and I look forward to his pursuing this question to the benefit of coke producers and users alike.

Mr. D. K. Clark's communication giving figures regarding the sales of coke are interesting, and certainly contain material for thought.

There is no evidence, however, to warrant the assumption that the new batteries of coke ovens which have been built in conjunction with steel works have been generally constructed in substitution for old plant. If it were so then the effect would actually be beneficial to the Gas Industry, as Mr. Clark has premised. The facts, however, entirely have the reverse effect, inasmuch as the coke oven plant at the steel works is mostly additional to coke ovens, which in many cases originally supplied the fuel for those Works. Not only is this so, but the tendency for collieries to put up coke ovens solely for servicing the domestic markets is increasing, so that the production of oven coke must increase if this plant is maintained in operation.

I agree with Mr. Clark that much of the direct benefit of an expansion of industrial consumption of coke would inure to the producers of furnace coke, as this is a market for which their product is primarily produced, whereas the extension of gas coke markets lies, logically, in the domestic and central heating field.

I have not been able to trace that there has been any previous attempt at allocation of the proportion of coke which is serviced to any particular market. I think that it may be found that the allocation in the London area is not typical of the rest of the country, and it will be considerably different for many of the industrial towns.

Dr. G. E. Foxwell raises the question in his very admirable contribution as to whether greater advertising and a more intensive sales campaign would be of value in the area of the London and Counties Coke Association. My answer is emphatically in the affirmative, and is based on the results which have been obtained by the comparatively small amount of money which has already been expended in this same direction.

I am quite in sympathy with the wider views which Dr. Foxwell takes of the coke industry. It is patent that the colliery owner is seeking outlets for his oven coke in markets other than the steel industry. It is also obvious that the colliery coke oven plants can manufacture a suitable domestic fuel and probably a fairly high volatile open grate coke.

An Ultimate Aim.

I have not been so bold as Dr. Foxwell in stating that the 40 million tons of coal which is now being used for domestic purposes can be distributed between gas and coke. I held that up as something which might occur in the dim future and something at which we might aim ultimately.

I am in entire agreement with Dr. Foxwell in his views regarding the benefit of united effort and co-operation between all coke producers, and, personally, I believe that the Gas Industry would look upon the proposal of co-operation with favour, the benefits which would obviously accrue would, however, be at once more considerable to the coke oven producers than they would be to the Gas Industry.

There would follow an expansion of markets on both sides,

but expansion in legitimate channels as best suited to the product and not in competitive channels; in other words, unnecessary competition would be eliminated.

Research into the value of coke fuel, its application to the various markets, would be more carefully studied and allocated. The consumer would consequently have a better product for his particular need, and not a product which is haphazard, frequently at the choice of the distributor.

The Gas Industry has already built up markets which are becoming adequate for the absorption of all the coke they produce. The coke oven industry is selling its product in these same markets, but is not having the advantages which co-operative selling would give it.

With regard to the handling of coke, I agree with Dr. Foxwell that the major consideration is the condition in which the coke arrives at the consumers' premises. Nevertheless, it is just as important in order to prevent deterioration of the material to handle the fuel as reasonably as possible in the course of its production. If the quantity of high class product can be increased by a better system of handling, then it will surely justify itself if the cost of such handling is not prohibitive.

With regard to Dr. Foxwell's last point concerning breeze, I can only say that this matter is at the present time receiving attention in several quarters. It is true that a proportion of the breeze which is presently sold could be produced as a more useful product. Further, a quantity of breeze is already used for re-mixing with the coal before coking.

I would like to thank Dr. Foxwell for his valuable contribution, and also all those who have so kindly given their views on the various aspects of my Paper. I should also like to add that the analysis of the ash fractions occurring in the various grades of coke was provided by the Tottenham and District Gas Company and carried out by Dr. R. Lessing.

"Field's Analysis," 1934

We have now received a copy of "Field's Analysis" for the year 1934, and once more take the opportunity this presents of reviewing in detail the latest developments of the progress of the Industry.

We will proceed at once to construct the framework of our survey by setting out the salient features as follows:

Gas Sold—Increase or Decrease %.

—	1930.	1931.	1932.	1933.	1934.
Metropolitan Companies	− 2·34	+ 1·78	− 3·16	− 2·21	− 0·57
Suburban ,,	+ 0·24	+ 5·02	+ 0·35	+ 0·19	+ 1·10
Provincial ,,	− 0·64	− 0·44	− 0·34	+ 0·16	+ 2·90
,, Corporations	+ 0·34	− 1·01	− 3·18	− 1·14	− 0·47

Number of Consumers—Ordinary (000's).

Metropolitan Companies	731	740	758	758	750
Suburban ,,	267	314	333	360	351
Provincial ,,	363	459	459	463	468
,, Corporations	573	577	567	557	550

Number of Consumers—Automatic (000's).

Metropolitan Companies	1,144	1,173	1,238	1,278	1,328
Suburban ,,	255	298	314	339	387
Provincial ,,	344	489	513	539	567
,, Corporations	551	594	619	646	674

Average Consumption—Ordinary.—Therms.

Metropolitan Companies	279	278	268	259	260
Suburban ,,	201	201	198	179	190
Provincial ,,	225	218	219	216	223
,, Corporations	197	191	184	183	183

Average Consumption—Automatic.—Therms.

Metropolitan Companies	121	121	113	108	103
Suburban ,,	118	118	114	117	102
Provincial ,,	101	104	100	97	93
,, Corporations	95	93	90	86	83

Metropolitan Companies.

[Pence per Therm.]

Year	1930.	1931.	1932.	1933	1934.
Net coal	1·375	1·455	1·368	1·339	1·200
Manufacturing charges	2·518	2·349	2·090	1·799	1·667
Cost of gas into holder (*ex* capital)	3·893	3·804	3·458	3·138	2·867
Distribution charges	2·504	2·558	2·662	2·948	3·109
Net coal and working expenses	7·883	7·804	7·690	7·687	7·579
Net profit	1·302	1·312	1·324	1·341	1·340

Suburban Companies.

Net coal	2·217	2·281	2·181	2·090	1·881
Manufacturing charges	2·201	2·244	2·134	2·129	2·039
Cost of gas into holder (*ex* capital)	4·418	4·525	4·315	4·219	3·920
Distribution charges	2·379	2·376	2·468	2·645	2·830
Net coal and working expenses	8·291	8·387	8·334	8·495	8·331
Net profit	1·191	1·270	1·292	1·241	1·299

Provincial Companies.

Net coal	1·718	1·916	1·769	1·678	1·581
Manufacturing charges	1·504	1·641	1·628	1·567	1·460
Cost of gas into holder (*ex* capital)	3·222	3·557	3·397	3·245	3·041
Distribution charges	1·900	1·806	1·798	1·829	1·849
Net coal and working expenses	6·417	6·566	6·404	6·296	6·122
Net profit	1·047	1·027	1·098	1·081	1·048

Provincial Corporations.

Net coal	1·587	1·638	1·742	1·582	1·555
Manufacturing charges	1·574	1·560	1·592	1·563	1·465
Cost of gas into holder (*ex* capital)	3·161	3·198	3·334	3·145	3·020
Distribution charges	1·610	1·501	1·469	1·410	1·426
Net coal and working expenses	6·156	6·119	6·276	6·049	6·047
Net profit	0·734	0·921	0·806	0·973	0·897

Net Gas Rental.

Metropolitan Companies	8·258	8·189	8·094	8·033	7·937
Suburban ,,	8·515	8·616	8·583	8·656	8·590
Provincial ,,	6·798	7·037	6·998	6·884	6·735
,, Corporations	7·966	7·977	7·927	7·878	7·662

Charge for Capital.

Metropolitan Companies	1·745	1·778	1·811	1·847	1·858
Suburban ,,	1·743	1·757	1·795	1·857	1·874
Provincial ,,	1·468	1·405	1·431	1·469	1·421
,, Corporations (interest only)	0·717	0·738	0·724	0·707	0·618

Public Lamps (000's).

—	1930.	1931.	1932.	1933.	1934.
Metropolitan Companies	71	70	73	73	72
Suburban ,,	30	35	35	35	36
Provincial ,,	59	81	83	82	82
,, Corporations	127	132	133	135	136

Stove Rental (000's £)

Metropolitan Companies	813	841	856	901	909
Suburban ,,	232	267	268	288	320
Provincial ,,	236	285	281	295	296
,, Corporations	98	117	120	128	127

(Note inclusion of following undertakings from 1931 onwards: Southgate, Watford, Liverpool, and Rochdale.)

We will deal firstly with the output of gas. Although the percentages of increase or decrease for all four groups of undertakings show an improving tendency, the figures indicate, particularly in the case of the Metropolitan and Municipal Undertakings, that the time has now passed when business is easily won.

Ordinary supplies both in number and average consumption show an inclination to contract somewhat, although it is hoped that the more progressive policies now being pur-

sued by many undertakings, aided by Press campaigns, will shortly begin to produce their reward.

Automatic consumers on the other hand continue to grow in numbers, but again the growth in consumption fails to keep pace with the growth in numbers, with a resulting decrease therefore in average consumption.

As a measure of the volume of apparatus on hire we may turn to the figures of stove rental. With the exception of the Suburban Companies these figures somewhat suggest inactivity, probably due to the growing preference for the hire-purchase policy. There is no doubt that a very urgent need exists for an enterprising and progressive policy of equipping consumers with up-to-date apparatus on terms that will permit and encourage the greatest possible use of gas.

A gratifying feature revealed by the " Analysis " is the strength displayed by Public Lighting, which actually showed an increase for all four groups of Undertakings.

Before leaving the selling side we may take a glance at prices charged for gas over the past five years. It may be remarked that, ignoring one or two trifling reductions, no undertaking figuring in the " Analysis " has been able to announce a reduction in the flat rate price of gas. One or two undertakings previously charging relatively low prices have in fact increased them to a point nearer the general level. Nevertheless the average price realized per therm shows a slight downward tendency, suggesting as a sign of the times that undertakings are relying more upon intensive methods of promoting business by special terms and discounts than by the old method of reducing the general or flat rate price.

Turning to the production side, we find here a fairly steady and in some cases appreciable reduction in the " Cost of gas into holder (excluding Capital Charges)." Again, as a sign of the times, expanding distribution charges, indicating liberal measures adopted to increase business, are particularly evident in the case of the Metropolitan and Suburban Companies.

Passing to the " Total Net Coal and Working Expenses " we find some improvement, but the accounts taken as a whole explain why there has been no general reduction in the price of gas. The truth of the matter seems to be that modern standards of service and equipment are expensive, but notwithstanding this, undertakings are keeping well abreast of the times and are spending money in the direction which will serve best to maintain business. The Industry no doubt is right in placing in the forefront considerations of quality and service in connection with its product. It must not be thought, however, that this is enough. It should not be forgotten that the public nowadays, owing to the competition of other fuels, are influenced by the price factor, taking the quality, rightly or wrongly, for granted. From this point of view, stationary prices over a period of years leave something to be desired, and therefore the sales incentive of a progressive price policy cannot be dispensed with. On this subject the general opinion is undoubtedly that gas charges should take a definitely promotional form in order to enable consumers who are willing to use more gas to obtain it at a really attractive price. In other words " Much more gas for a little more money."

The financial results for the past year again reveal the essential soundness of the Industry, profits and dividends being well maintained.

In conclusion, once again we compliment Mr. H. E. Ibbs and his staff on the results of their work, which should be of great benefit to all engaged in the Industry.

The " Analysis " is now on sale and copies may be obtained from Messrs. Eden Fisher & Co., Ltd., 6, 7, and 8, Clements Lane, London, E.C. 4. Price £2 2s.

Mr. William T. Patrick, J.P. (centre), Chairman of the Guildford Gas Light and Coke Company, with Mr. W. H. Oakley, a Director, and Mr. L. J. Langford.

In Surrey's Capital

Southern Association at Guildford

On Tuesday, June 25, members of the Southern Association of Gas Engineers and Managers spent an enjoyable day at Guildford, in charge of whose gas undertaking is their President, Mr. E. L. Nicholas.

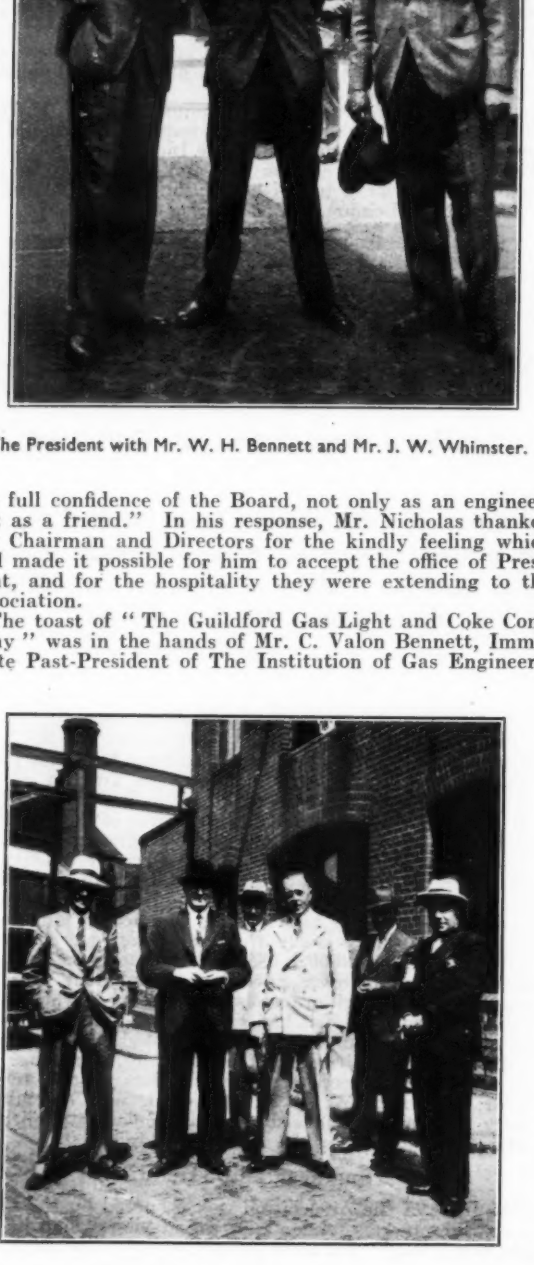
Guildford is one of those towns where modern has been blended with ancient in such a manner as to secure the best of both with the worst of neither. It retains much of the calm dignity of its great age alongside of a progressiveness upon which the citizens are to be congratulated. It is evident that Guildford has been well served by its public-spirited leaders in the past, and that this good service is still maintained. Referring to one of his sketches of the High Street, Ogilvy says it shows the Gateway of Abbot's Hospital, the churchyard wall of Holy Trinity opposite, the Exchange, the Town Hall, the tower of St. Nicholas Church, and the rising ground beyond on which the gallows and gibbets were placed, as stated by Spencer in 1771, " so that the shopkeepers can stand at their own doors and see the executions." This privilege has long since departed, but others more suited to later times have taken its place. This was found to be the case when, on Tuesday of last week, members of the Southern Association of Gas Engineers and Managers assembled at the works of the Guildford Gas Light and Coke Company, whose Engineer, Mr. E. L. Nicholas, is their President. That there were some 125 acceptances of the invitation of the Chairman and Directors, showed that Mr. Nicholas had whetted appetites by the description of the undertaking included by him in his Presidential Address some three months ago. [" JOURNAL," April 3, pp. 46-50.] So recent an account makes it unnecessary to do more now than compliment those responsible upon a well-ordered and " roomy " works.

The plans for the visit had been " well and truly laid," and they included luncheon in the Borough Hall, with Mr. W. T. Patrick, Chairman of the Company, presiding. He was supported by colleagues on the Board, and by the Mayor, Alderman W. G. L. Sheppard, who extended a hearty welcome to the visitors, and spoke in admiration of the administration of the gas undertaking.

Engineer and Friend.

The toast of the Association was proposed by the Chairman, who gave expression to a sound view, when he said that people ought not to hold positions of responsibility in connection with public utility undertakings unless they were prepared to carry out these responsibilities in a manner which was going to be to the advantage of the community they served. " If," he declared, " we provide the best possible article at the most reasonable price, none of us need fear the future. Consumers do not mind paying

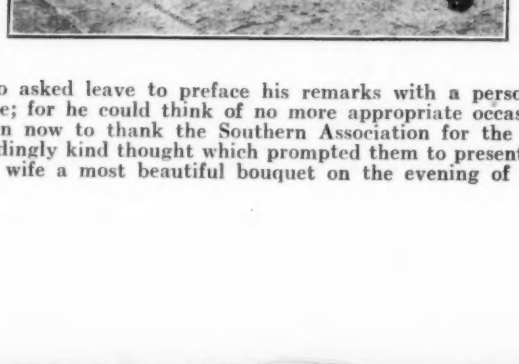
their bills, provided they are assured that they get value for the money. As to Mr. Nicholas, I say unhesitatingly that you were wise in asking him to become your President. In him you have a man who will put his heart and soul into the welfare of the Association. He is an able engineer, and is exceedingly keen on his work; and he has



The President with Mr. W. H. Bennett and Mr. J. W. Whimster.

the full confidence of the Board, not only as an engineer, but as a friend." In his response, Mr. Nicholas thanked the Chairman and Directors for the kindly feeling which had made it possible for him to accept the office of President, and for the hospitality they were extending to the Association.

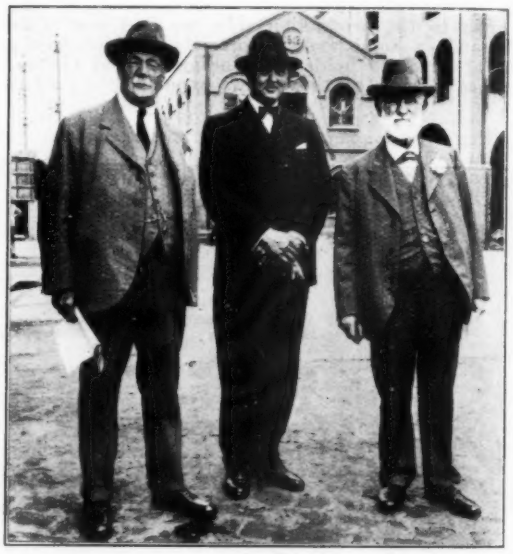
The toast of "The Guildford Gas Light and Coke Company" was in the hands of Mr. C. Valon Bennett, Immediate Past-President of The Institution of Gas Engineers,



who asked leave to preface his remarks with a personal note; for he could think of no more appropriate occasion than now to thank the Southern Association for the exceedingly kind thought which prompted them to present to his wife a most beautiful bouquet on the evening of the reception and dance at the Park Lane Hotel. The presentation was made by Mrs. Nicholas, and the gracious manner in which she did it, coupled with the good wishes of the members, would always remain in the memories of Mrs. Bennett and himself.

The Right Policy.

Proceeding, Mr. Valon Bennett said that Mr. Patrick had been connected with the Company for more than thirty years, and had been Mayor of Guildford on no less than three occasions. The Company had much for which to thank Mr. Patrick, and the citizens should be grateful to him for all the service he had so willingly given to them. The Vice-Chairman, Mr. R. T. Billing, had been a Director of the Company for eighteen years, and was now in his 86th year. Apart from the Borough of Guildford, the Company's area was largely rural, and therefore it was all the more remarkable that since 1923 the consumption of gas had almost doubled, having risen from 220 million cu.ft. to 413 millions. This increased consumption had not been obtained by sitting down and waiting for business to come, but by going out and seeking it, and retaining it by efficient service. That had been the policy of the Board of the Guildford Gas Company. Long might they continue to carry on their good work, and thus ensure prosperity and the admiration of all.



In his reply to the toast, Mr. Billing expressed the indebtedness of the Company to Mr. Nicholas, who missed no opportunity of increasing the consumption of gas and adding to the number of consumers. The Chairman was heartily thanked for presiding, on the proposition of Mr. W. A. Howie, the Secretary of the Association.

Very Largely Rural.

The correctness of Mr. Valon Bennett's remark that the Company's area of 80 square miles is largely rural was realized during the afternoon, when motor coaches made a lengthy tour, the whole of which was within the Company's limits of supply, through some of the most delightful Surrey scenery. Beginning with Bramley, and passing on to Cranleigh, whose gas and electricity undertaking was purchased by the Guildford Company in 1932, the drive was resumed through Shere to Newlands Corner. Tea was served in the commodious Newlands Corner Hotel, and the return to Guildford was by Merrow. Unfortunately, time was short and visibility was faulty, so that opportunity did not serve for adequate admiration of the views of Chilworth and St. Martha's Chapel, but sufficient was seen during the whole of the route to carry conviction that the rural portion of the Company's area contains not only many possibilities from a business point of view, but also a wealth of natural beauty.

Before separating, the visitors loudly applauded a hearty vote of thanks proposed by Mr. J. W. Whimster to the Chairman and Directors of the Gas Company for their hospitality, and to Mr. Nicholas and his staff for the arrangements which had made the day the great success that it had been.

Waverley Association of Gas Managers

Annual Meeting in Edinburgh

The Annual Meeting of the Waverley Association of Gas Managers was held in the Goold Hall, Edinburgh, on Friday, June 28

THE PRESIDENT,
Mr. E. SHIELL, Langholm.

The PRESIDENT (Mr. Eric Shiell, Langholm) in opening the meeting extended, on behalf of the Association, a very hearty welcome to all members attending. He said he wished particularly to include in this welcome members from overseas, Mr. F. W. J. Belton (Christchurch, New Zealand) and Mr. J. K. Harrison (Armagh).

After the minutes had been read and approved the SECRETARY (Mr. R. J. Philp, North Berwick) intimated that apologies had been received from members unable to attend.

In putting forward the name of Mr. R. J. Gavin (Melrose) as his successor, the PRESIDENT said that he was proposing another young Borderer. He had every confidence that Mr. Gavin was a suitable man for the post and he was especially glad to see that young blood was getting a chance to have its say.

Mr. J. BELL (Dumbarton) in seconding, said that he thought that they were acting wisely in bringing out the merits and talents of the younger men in the Border districts and he looked forward to the Association having another successful year.

Mr. GAVIN in acknowledging the honour which had been bestowed on him said that, as a Borderer, it gave him particular pleasure to accept, as one of his predecessors at Melrose was among the founders of the Association.

Mr. Philp was re-elected Hon. Secretary and Treasurer and Mr. J. O'Halloran remained in office as Auditor of the Association.

The following new members of Committee were elected: A. Dow (Galashiels), D. Melvin (Edinburgh), and R. Hamilton (Dalkeith).

Presidential Address of Mr. E. Shiell, of Langholm

In these days, when the specialist in our Industry becomes ever more prominent, the high standard of technical education and ability shown by the authors of countless papers dealing with our profession sets a difficult task to that jack-of-all-trades—the manager of a very small gas-works. The shadows of very experienced and successful predecessors in my office overhang me as I write, and it is in endeavour to combat a certain feeling of inferiority I have determined to confine my remarks as far as possible within the bounds where I should be least assailable—the knowledge bought by actual and often bitter experience.

In presenting any theories or generalities, I do so with the knowledge that they are open to the free and frank criticism for which this meeting is justly famous. If this Address had a title, it would be "An Attempt at Resuscitation." Almost invariably the papers put before us are presented by men who have achieved success in their particular fields of endeavour. Perhaps this Address will be by way of a change!

The Langholm Gas Undertaking.

The Gas Company I serve supplies the small town of Langholm, situated midway in rugged country between Hawick and Carlisle. A branch line railway terminates here, and around is a large expanse of thinly populated hilly country, these factors giving the town the qualification of being "isolated" when one has thoughts of connection with a possible gas grid. The population of 2·3 thousands is almost entirely dependent for its livelihood upon five small tweed factories which are suffering in common with the rest of the Scottish Borders from the general stagnation.

Before laying before you the present position of the small gas company, and my own efforts in its service, I had better touch lightly upon its past records so far as I can trace them. Though I do not intend to convey that such situations were typical among small gas concerns, it is singularly unfortunate how often one comes across records of such murky pasts among the histories of such concerns. So far as I can trace, even up to a few years ago, the attitude of the Company has been one of torpid indifference to the needs of the gas consumers, combined with pitiful neglect of works, plant and mains, punctuated by annual outbursts of activity in the Board Room when a dividend was in prospect. As an example, in 1927 the price of gas was 9s. 2d. per 1,000 cu.ft., the whole plant in a deplorable state of disrepair, the percentage of unaccounted-for gas enormous, and public sentiment, already abused, was not further endeared to the Gas Company by such an action as the switching over in a single night from straight coal gas to enriched water gas of about 415 B.Th.U. When I took over 4½ years ago, I found my immediate predecessor had done much to clean up the mess, but the public of such a small community as ours is very slow to forgive injury, and I am often confronted with an inbred antipathy towards our gas activities.

Because our type of manufacturing plant can be seen in many small works, I do not intend to bore you with a long detailed description of it. Two small beds of horizontal retorts—one bed kept as spare—are used in conjunction with a hand-operated Tully coal gas plant of 70,000 cu.ft. per day capacity. The quality of gas supplied is 415 B.Th.U., and about 0·526 sp. gr., and we find that this combination of plant gives great ease of quality control. By means of Peebles jet photometers placed in the retort house, the quality of gas passing through the meter is always confronting the stoker, and the time lag of a correction in quality is very short. Instead of using these photometers with the length of jet at the usual 1 in. per 100 B.Th.U., I keep them set at 1½ in. per 100, so that any variation in quality has a more pronounced effect upon the jet and is more quickly seen. Some of the virtues possessed by this type of manufacturing plant are: The ease in periodic clinkering and repair to the generator brickwork, the speed with which one can "let down" and "heat-up" the plant, and the wide range for varying the output per hour.

Unfortunately our particular coal gas plant is much over-capacity for our present total gas output, and I am not able to present very efficient results, varying from 65 to 73 therms per ton according to the time of year. Contradictory as it may seem, the very fact of the gas output being so speedy cancels a great deal of the plant's efficiency, this being most obvious in summer time when we are able to manufacture and store in eight working hours sufficient gas for the day's demand. Naturally, during the long period waiting for the next spell of action the plant loses most of its heat, and we have experienced great difficulty in summer months combating smoke nuisance caused by the blow gases failing to ignite in the cold combustion chamber.

A Serious Grudge.

Lastly, I have one serious grudge against this combination of plant, a grudge which arises solely from our geo-

graphical position. In Langholm there is a market for some 600 tons of coke per annum. Instead of the gas-works being in the usual position of being able to supply most of the local market, I have to watch with envious eyes about 95% of this trade passing my door, and, to my mind, not even the combined saving in coal and wages brought about by the use of the Tully plant can compensate the Gas Company for the loss of that handy nest-egg—the revenue from residuals.

Barring the two gasholders, there is little in the rest of the works plant to hold interest. We are lucky in having the use of three purifiers of ample capacity, the boxes being 12 ft. 6 in. square. This comparatively large purifier capacity I regard as a very important point, since it must be remembered that the throughput per hour from a Tully plant such as ours is approximately equal to that of a works three times our size, which employs horizontal retorts only. Again, since we do not dilute with air, the oxide has more frequently to be revivified.

Referring to the gasholders, I would like to introduce you to an old warrior who is celebrating his centenary next year. Of 5,000 cu.ft. capacity, this holder was once the sole storage for the works, but, for the last twenty years, has acted as the foul gas container between the plant and the exhauster. Without this old tank, life in our works would be rather complicated, and, hideous though it looks, its general condition of tightness is a testimony to those who put their faith in wrought iron.

When I took over, the sole storage for town's supply was a wrought-iron column-guided holder aged 65 years, and, of 16,000 cu.ft. useful capacity, this combined with a daily output of 50,000 to 60,000 cu.ft., tending to make life at times exciting. I had no alternative but to ask my Directors to consider a new holder of ample capacity. With thoughts of the usual 9 in. or 12 in. flat slab foundation, I had some test holes dug on the site, and to our astonishment, before reaching rock, our shoveller dug himself out of sight some 11 ft. down without using a pick. I was later able to prove that our site was once an old lake or marsh which had been filled in with soft refuse, principally tan-bark from the skin yards. The job was then placed in the hands of a well-known ferro-concrete firm and, under their direction, a ferro-concrete foundation was laid upon 36 piers of mass concrete, all reaching down to solid rock an average depth of 8-9 ft. Niches had to be cut in the slanting strata to give the piers a firm footing. A 50,000 cu.ft. capacity spiral-guided holder was built in the usual fashion, and despite an average pressure of 16 cwt. per sq.ft. upon the foundation, there has been no sign of subsidence.

Eighteen months ago this holder was oil filmed internally with the idea of cutting down the number of waterlogged services, and, although not a complete cure, the number of complaints has been halved. When we introduced the oil into the holder there were about 40,000 cu.ft. of gas in stock, and not being able to wait for a full extension, I screwed a seal pipe and filler on the top centre plug. With all hands on deck, we made a quick job of inserting the 300 gallons of oil; but, to our horror, on descending from the holder, we found that the oil, spraying from the top of the holder to the water surface, had washed some 14 therms of heating value out of the gas, reducing the calorific value from 420 to 385 B.Th.U. Luckily we were able to enrich the stored gas again before lighting time.

Gasholder Inspection and Insurance.

While dwelling upon the subject of gasholders, it would be interesting to learn from you some opinions regarding the insurance and inspection of gasholders. We are all being asked to consider a policy of insurance which provides against accidental damage to the structure of gasholders, and includes periodic inspection by an independent surveyor, metal tests, water analysis, and supervision of small adjustments. I think the greatest obstacle to such a scheme is the annual expense, but the chances are that the cost would be less if the scheme was in universal use.

Having got the plant into reasonably good working order, mains and services attracted my attention. The unaccounted-for gas stood at the extraordinary figure of 22%, the leaky holder being responsible for a large amount. Broken mains were found to have been left in a state of temporary repair, and a large number of services left to rot, still connected to the mains. Pipe plans were non-existent and drip boxes were lost. It should be a standfast rule in every gas-works that all underground pipes be drawn in plan with copious reference notes. As an example of what can happen when one is ignorant of the main circuit I can quote our experience on one exciting evening after a local plumber had included a 3 in. gas main as a brick in the structure of his water tobie. Some 300 consumers were flooded off within an hour, and many low lying houses had meters and house pipes filled with water to a height of 3 ft. before we got on the spot. It took a frantic all night's search for the broken gas and water mains and the best part of a fortnight's work to clear up the mess.

According to our last four balance-sheets, I note that items of repairs and renewals to mains, services, and meters account for £1,250—a very heavy outlay for a small company, and further proof of the adage, "A stitch in time . . ." The unaccounted-for gas has, however, been decreased to 11% annually, and, although this figure is still far too heavy, it is at least nearer.

I find it impossible under present conditions to manufacture gas of even a moderate price. The greatest obstacle in the path to cheap gas is the small average consumption per meter, and in our case we have heavy carriage duty to pay on coal—7s. 3d. per ton. The results over three years show that gas into the holder costs £147 per million cu.ft., and cost of distributing the gas sold was £75 per million—in other figures, 8·5d. and 4·33d. per therm, making a gross cost of 12·83d. per therm. Small gas companies have now to face additional burdens which did not trouble them in former years—fitters' wages, outlay on hire purchase schemes and maintenance schemes, showroom expenses and so on, while, in most cases, the revenue from consumers is shared with electric opposition, making a slower return of capital expenditure.

When gas men meet, the predominant topic of conversation is ever the attempt to increase the sale of gas. Indeed, so much of my working time is employed in treading the thorny path of a gas salesman that I often wonder how in past years our forerunners managed to fill in their leisure.

With one eye on the advent of electricity into the town and the other on small consumption of gas per meter, I employed a fitter, started hire purchase of cookers and appliances and P.T.M. sale of fittings. Being meter reader and collector, I have close contact with the customers, and no opportunity to canvass for sales is lost. A cooker and general appliance exhibition was started to set the ball a-rolling, and, considering the start from zero, the lack of showroom accommodation and general poor state of trade in the town, I have had a fair share of work. Fittings to the value of £850 and cookers £1,050 have been issued during the past four years, and I am safe in asserting that, had this sales policy not been hastily carried out our position would to-day have been precarious.

Sales Campaigns.

In sales of some lines of gas appliances I must admit disappointment, however. Our price of gas does not lend itself to sales of gas fires, and in lighting switches and water heaters I have definitely failed to get results. My consumers, suffering from purely local ideas, look askance at the idea of burning a small by-pass night and day, and when offered the costlier catalytic ignition as alternative they compare the price with that of an electric point, to our disadvantage. I did have high hopes with my water heater campaign, but again I failed. This is all the more disappointing when it is considered that only one house in twelve has domestic hot water supply. Quite probably my canvassing has been at fault here, and I have an idea that if a strange canvasser with suitable personality had been employed to boost gas water heaters we would have been more successful.

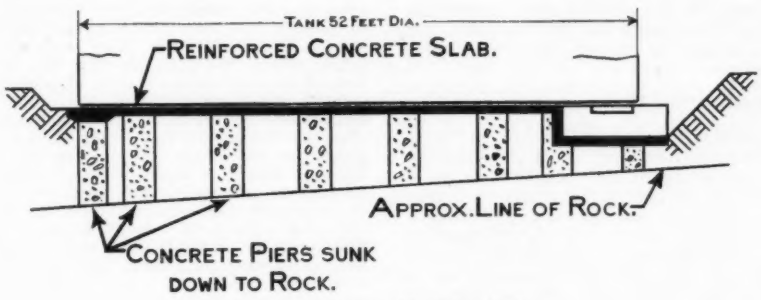
While pushing the sales of gas appliances I thought it politic to make the price of gas a more attractive proposition. Formerly the price had been a flat rate of 6s. 8d. per 1,000 cu.ft., or 19·3d. per therm, with a small discount for accounts of £50 and over. A full year's meter collection in three surveys showed that the average domestic consumption annually was 8,500 cu.ft., while 20% of the consumers could not be remunerative, so little gas did they use. It was with the dual purpose of forcing these latter to use more gas and to encourage our larger consumers in every way—always with an eye on the approaching electrical storm—that I persuaded my long-suffering Directors to adopt a crude block scale of prices as below:

—	Ordinary Meter Consumers. Per 1,000 Cu.Ft.	Slot Meter Consumers Per 1,000 Cu.Ft.
	s. d.	s. d.
Below 1,000 cu.ft. at the rate of . . .	7 6	7 6
Between 1,000 cu.ft. and 3,000 cu.ft at the rate of	5 10	6 3
Between 3,000 cu.ft. and 10,000 cu ft. at the rate of	5 5	5 10
Over 10,000 cu.ft. at the rate of . . .	5 0	5 5

Each survey account to be independent. Three surveys per year.

I regret to have to admit that this scheme has proved a failure. Certainly the number of unremunerative consumers has been much reduced, and a few people did take

full advantage of the lower rate, but, in the main, the scheme has been quite disregarded by the public. Coinciding as it did with the loss in trade to electricity, we have not behind us sufficient resources to make the scale of prices a spectacular one, and so catch the public fancy. The upshot is that, with the average price of gas sold under this scale working out at 5s. 7d. per 1,000 cu.ft. (16·1d. per therm), and the average consumption standing



A drawing of the gasholder's foundations.

at 10,000 cu.ft., we find we have made an unappreciated gift to the public of 1s. 1d. per 1,000 cu.ft. Further, a year ago we found it necessary, owing to an excessive demand for slot meters, to impose upon all prepayment meter users that their annual gas accounts total a minimum of £1. Admittedly, this attempt to gain more turnover by lowering the selling price was an experiment following the lead of many large companies, but perhaps we are too small, with too limited resources, to follow it to a successful conclusion.

Electrical Competition.

Most of us here are competing with electricity, some of us for a long time past; but since I believe the Dumfriesshire County Council's electricity scheme is unique in Scotland at least, the C.C. being the distributing and selling agency, some details of this scheme might interest you. On a small scale it is nationalization, in that the C.C. have power to draw upon the public funds by increased taxation should the scheme not pay its way. Powers had been obtained to borrow from the usual Governmental source up to £500,000, and, after two and a half years' activity, over 500 miles of land wire has been installed and over 5,000 consumers enrolled. I have been unable to procure exact figures of expenditure to date, but think it is in the region of £400,000, giving you an idea how the capital expenditure per average consumer works out at present. The advertised charges for electricity are many and varied, with assisted wiring schemes—£1 per living room per annum, *plus* ¾d. per unit, 8d. per unit flat rate, 10d. per unit for slot meter, assisted wiring, and street lamp charges of 28s. per lamp, *plus* ¾d. per unit (making for 100 W lamp at 1,000-hour season 34s. 3d. per lamp). Town councillors were pressed to do their utmost to further the scheme in their localities and, as was to be expected, gas was given short-shrift in county owned buildings like schools and police stations. During the first year of activity this scheme pirated 20% of our output, and only by extra push in the sales of appliances were we able to regain some 12%. Despite our best efforts our street lighting offer was turned down, not even a three-year contract being considered. We were not even permitted to erect a large modern gas lamp for exhibition. The Town Council then installed 100% electricity in a manner which suggested heavy pressure from the County Council. The excuse given was that "they were not willing to commit their successors in office down to a gas contract in the face of electricity." On the other hand, a 20 years' loan was taken out to defray expenses of conversion to electric street lighting, and, sad to relate, the running costs for inferior street lighting under this scheme have so far exceeded our gas contract offer.

Nevertheless, by a scheme of very persistent canvassing, aided and abetted by wireless agents, the C.C. is forcing the small gas companies in Dumfriesshire against the wall and, during the past years, at least 30% of the lighting business has been lost. When it is borne in mind that 50% of the output of such small companies as ours is for gas lighting purposes, the position becomes serious indeed. In this particular county I foresee danger to us should the taxation be raised to aid the electricity scheme. The average man, already tempted by glamorous offers, will say he may as well have the use of electricity if he has to pay taxes for other people to benefit.

In summing up our position, several conclusions have been forced upon me. The majority of the people I meet are firmly convinced that electricity is *the* light and fuel of the future, and that it is only a matter of time before gas is superseded. Until this misguided opinion regains its balance we must never relax our efforts in gas salesmanship, no matter how insignificant the opening may seem. Secondly, it is useless to appeal to the public sentiment or local patriotism on the grounds of services rendered in the past, local industry paying heavy taxes, and so on. The only local patriotism I have ever seen to operate has

Two views of the work in progress.

been when members of town councils are directors of gas companies. Thirdly, the average householder considers only his own ease, and particularly in the case of lighting he is allured with the prospect offered by the electric switch, the banishment of dirty ceilings, burnt fingers, and hissing burners. Quality of lighting and cheapness seem to be the last consideration. Wireless has proved a deadly enemy, and when the prospects of electrifying a house are under consideration poor old gas is made the scapegoat for battery charging expenses. Finally, the tendency of migration from country to city, combined with the ever-increasing habit of shopping in the nearest city, leaves the state of trade in the small town standing still, at the same time giving an easy expansion to the suppliers of public services.

Amalgamation.

Dare I express an opinion on amalgamation—a topic which is fresh in our thoughts nowadays? It has already been proved that the supplying of gas concerns from a common main has been advantageous in districts where the distance between stations is not excessive. When a series of isolated gas concerns are joined by a financial pool a totally different situation arises. In the latter case the gas-works must remain as individual working units paying their way as previously they did. The advantages claimed for this method of amalgamation are mainly in combined buying of materials and fuel to gain better rates, and in the availability of expert knowledge to the smaller concerns should it be required. While I allow that the assistance gained in expert canvassing and salesmanship would undoubtedly be an aid, the saving effect upon the tiny turnover of a small gas concern would be but a flea-bite, and I am afraid that any benefits gained would be swallowed up in the increased administration expenses which usually accrue to financial amalgamations. The Gas Industry is solid in its opinion that the necessary capital for any such amalgamation should come from inside the Industry and not from independent financiers who are looking for a safe investment. We cannot but look with suspicion upon capital inflation and omission of steps which should be taken to safeguard the interests of the public—our customers. Shareholders, when considering any tempting offers for their holdings in gas companies, should remember the present-day difficulty in getting suitable re-investment for their money. It is a pity we have not got a few more Gas Light and Coke Companies scattered throughout the country to take command.

I conclude with a controversial subject—that of gas managers and their Associations. It may seem peculiar to some of you that I, being the recipient of the highest honour which the Waverley Association can confer, should point a finger of criticism at our Associations. I am very appreciative of this honour. Nevertheless, I do think that our Associations have not followed the trend of modern requirements where gas managers are concerned. Let me briefly sum up their privileges.

We meet once or twice a year and listen to technical or trade Papers and debate upon moot points. We may widen our outlook by visiting other plants or factories. We meet socially at a dance, a game of golf or bowls, and thereby break the routine of our daily work. We have the benefits of an education scheme, and we can appeal to the benevolent funds if unlucky.

I maintain that these advantages or benefits are not enough, and that our Associations are feeble elements in the affairs of a gas manager's life. The great majority of gas managers are in charge of small works, and with the continuous advance of amalgamation in one form or another there is much uneasiness suffered when the question of status, or even retention of post, crops up. There is nobody with sufficient powers to whom we can appeal for help or legal defence when we are in times of stress. I can, on the other hand, quote—more fully if necessary—a case in which a borough surveyor and sanitary inspector was able to regain his post after dismissal solely through the powers of legal defence supplied by his association.

Again, a great many of us will remain as managers of small works to the end of our working days without having paid into a superannuation fund or pension scheme, and after our retirement from active service we shall be dependent upon our savings *plus* the charity of our former employers. Are there insuperable difficulties to prevent associations organizing a pension scheme?

When a vacancy occurs nowadays competition is more pressing among gas men than ever it can have been in former times. In the face of this we have no minimum scale of salaries which can be enforced by our Associations, thereby cutting out the evil of underselling ability when answering an advertisement which asks "State salary expected."

In short, I would like to be a member of a "trade union" of gas managers. I know that such powers are outside the scope of our Associations under their present constitutions, but that should not preclude consideration in a future which is certain to become ever more difficult.

Discussion.

Mr. J. RICHMOND (Penicuik) said that he did not agree with the statement that the directors of a company regarded the working of the undertaking with torpid indifference. As a Manager of a small works he had never experienced this. It was true that they sometimes left the consumers to do a good deal for themselves, but nowadays consumers were spoonfed; they became indifferent, and then the undertaking was unable to retain them. He complimented Mr. Shiell on his fine description of the dual carbonization plant and said that he had given a frank statement of the position. He had said that it did not compensate for the loss of residuals, but Mr. Richmond thought that the remedy lay in making straight coal gas. He was surprised at the result of spraying oil into the holder, as he thought that this would have enriched the gas. Mr. Shiell's opinion on canvassing was contrary to what had been experienced in other districts in the Borders where better results were obtained with their own men than with strange canvassers. The question of differential charges, Mr. Richmond said, had been to the fore for a long time, but he thought that the best results were obtained in a small undertaking by giving a 50% reduction to all consumers on the gas used above their average for the last three years. As regards amalgamation, he said that the small undertakings were established for the benefit of the consumers, with whom a happy alliance existed, and to sacrifice this for monetary gain went against the grain. He agreed with what had been said about superannuation, but felt that this would fall on deaf ears.

Mr. D. VASS (Perth) said that the question of holder insurance interested him particularly, as he was at present considering this. The cost of this type of insurance was certainly high, but they at present insured boilers in this way. He thought that the best way was to consider the cost of insurance against the capital cost of the holder, and then it would be seen that the cost of holder insurance was not so high if they considered boiler insurance in the same way. He was glad that the question of superannuation of gas managers had been brought forward. This had been considered before, but the proposals made then had fallen flat. He did not see why the question should not be reconsidered, and he thought that the Gas Engineers' Association was the correct body to do this. The stumbling block would be as it had been in the past—that the higher salaried men would not take part. This was very petty, as their strength and support were needed. Even if it did not benefit them it would do their fellow members good. As regards the question of oil in the holder, Mr. Vass said that the results depended on the oil used. In the case quoted by Mr. Shiell the gas had been stripped of its benzene content.

Mr. R. J. GAVIN (Melrose) said that he wished to congratulate Mr. Shiell on his endeavours to resuscitate the Langholm gas undertaking. He had struck a modest tone, but Mr. Gavin admired his courage in telling of his failures. He was surprised to hear that the block scheme of charges had not been a success, as he imagined that to give consumers cheap gas after a certain quantity would have assisted the water heating campaign. Gas was the best way of heating water in domestic dwellings, and he advised Mr. Shiell to continue, as he felt sure that he would ultimately be successful.

A Comparison with New Zealand.

Mr. F. W. J. BELTON (Christchurch, New Zealand) said that he wanted to congratulate Mr. Shiell on occupying the chair of the oldest Gas Association. He himself belonged to, and had been President of, what was probably the youngest Gas Association. He had listened to Mr. Shiell's Address with great interest, as the problems arising in small works in New Zealand were much the same as those described. They were also faced with fierce competition from electricity which was supplied in some districts for water heating at a price of ½d. per unit. Then in New Zealand their plant had to be imported, and consumers' houses were not so close together. In Christchurch, with 24,000 consumers, they required 300 miles of mains. He had found that when one was up against a difficulty the best way was to get right into it, and if one scheme did not work then try something else. In New Zealand power boards could levy what was known as an availability rate. This meant that if power lines ran through agricultural land the farmer was charged so much per acre even if no current was used. He was astonished to hear that Mr. Shiell's scale of charges did not work. In Christchurch they were holding their own with the cooking and water heating loads. On water heaters they had a supply charge of 5s. per month, and the normal price for gas was 3s. 7d. per 1,000 cu.ft. For water heaters the charge was half the normal rate, and where these were fitted all other gas used was charged at the half rate. Even then gas was not so cheap as electricity; but in spite of this, and considering the state of affairs in the town, they were doing very well. This was because of the service they gave.

Mr. J. O'HALLORAN drew attention to the interesting fact that in a report of a meeting of the Gas Institution which appeared in the *Edinburgh News* in 1885 it was stated that "gas had nothing to fear from electricity."

Mr. J. BELL (Dumbarton) said that he did not think that it was worth while for the Association to take up the question of

superannuation. It was only a matter of years until this would be made compulsory by Parliament. He therefore thought that any work done by the Association in this direction would be overlapping. This legislation which would make superannuation compulsory for all Corporation employees would not cover all gas managers, but if engineers were alive to their own interests he thought that they could try in their own districts to persuade local authorities to allow them to come in with Corporation workers.

Mr. D. FULTON (Helensburgh) said that the Address expressed the natural man—his strength and his weakness, his likes, dislikes, and prejudices. Mr. Shiell had breathed new life into the dusty bones of the Langholm undertaking and the hope of the small undertakings lay in the fact that they were in the charge of men like Mr. Shiell. He disagreed with Mr. Shiell on the matter of canvassers, and said that a local man, known to the people would do far better than a stranger, no matter how guileful. Mr. Shiell in this respect was too modest; he must not expect results too quickly and should keep on repeating his efforts. The formation of a trade union was but a vision, an impracticable vision, as there were too many conflicting aspects ever to get successful operation.

Mr. A. S. NISBET (Paisley) said that he was interested to hear of the electrical competition with which Mr. Shiell was faced. Paisley, probably more than anywhere else, suffered from this. He did not think, however, that they had any cause to be down-hearted about this. No undertaking could be successful which was being run on uneconomic lines.

Mr. A. DOW (Galashiels) said that they were a conservative people on the Border, but once convinced they were firmly on one's side. For this reason he advised Mr. Shiell not to give up hope but to fight on. He himself did not establish any block system in Galashiels except differential rates for the lighting load. Even with the dull trade which had been experienced in the tweed trade of the Border he had doubled his output within the last seventeen years, and it was still increasing. With regard to the Tully gas plant, he pointed out that it was impossible to take the most out of the coal and still have the residuals, and this was a matter on which a definite decision must be made.

The President Replies.

Mr. SHIELL said that he seemed to have given the impression that he was losing hope. This was not the case; there was not the vestige of such an idea in his head. He agreed with Mr. Richmond about the carbonizing plant and said that a lot depended on geographical position. Mr. Braidwood at Coatbridge paid less attention to therms per ton than to total return per ton, and he thought that at Langholm he would be better with the old type of plant. In canvassing he admitted that local experience and knowledge went a certain length, but he had found that a strange electrical canvasser could make erroneous statements and when he tried to correct these statements he was not believed. This gave him the impression that a stranger could help. As regards the insurance of holders he said that this was an instance when a large undertaking could not give a lead to the smaller, because the larger companies had a staff employed on holders while the small man had to do the inspection himself. The greatest danger in the use of spiral-guided holders was in winter when ice might form. He had seen an instance where a slight carelessness had caused great damage—which would have been covered by insurance. He thanked Mr. Gavin for his remarks and wished him a successful year. On behalf of the oldest Gas Association, he said that he had a great deal of pleasure in asking Mr. Belton to convey to the youngest Association their best wishes.

Mr. BELTON said that he was happy to convey this kindly greeting, and he was sure that the Gas Institute of New Zealand would heartily reciprocate.

Presentation to Retiring President.

Mr. G. BRAIDWOOD, in presenting the Association medal to the retiring President, said that they need have no fear for the future when they had men like Mr. Shiell to carry on.

Mr. J. BELL (Dumbarton) proposed a vote of thanks to the President and wished him every success.

The following new members were elected:

Ordinary Members.

J. S. Ednie (Engineer and Manager, Lesmahagow).
J. Scobie (Engineer and Manager, Stonehaven).

Extraordinary Members.

F. Hailstones, Messrs. Milne & Mitchell, Glasgow.
R. Malcolm, J. G. Stein & Co., Ltd., Bonnybridge.
W. Cowper, Henry Balfour, Leven, Fife.
W. J. Crawford, R. & A. Main, Ltd., Falkirk.
J. Peat, Secretary, Pittenweem Gas Company.
L. Beale, Woodall-Duckham Company.
Wood Smith, Stanton Iron Works, Glasgow.

Luncheon.

At the conclusion of the meeting a luncheon was held in the North British Station Hotel. After the Loyal Toast had been observed, Mr. R. J. GAVIN proposed the toast of Kindred Associations. He said that never in the history of the Industry was the need for co-operation greater than it was to-day. He hoped that this spirit of co-operation would be enhanced in the future and that they would present a solid front to the elements warring against them. He predicted that they would see the day when the Gas Industry would be even more powerful than at present and had no doubt that its prosperity would continue.

Mr. G. BRUCE (St. Andrews), President of the North British Association of Gas Managers, in reply said that Mr. Gavin in speaking of the fellowship which existed between one Association and another had struck the right keynote. He did not agree with the remarks about small undertakings which had been made in the President's Address. It was not a question of the size of the works but of the man himself. He did agree, however, that this was a trying time, and nothing in this world was obtained without striving.

The toast of the President was proposed by Mr. R. W. COWIE (Hawick), who said that he had known Mr. Shiell since he was a small boy, and even thus early he had shown his present traits of originality, perseverance, and initiative. Mr. Shiell's father had been Manager at Innerleithen and Mr. Cowie himself had succeeded Mr. Shiell's grandfather, who was a former President of the North British Association. The Langholm Gas Company and the community of Langholm realized that they had been fortunate when they got Mr. Shiell as Gas Manager. As Mr. Shiell's true self became known he would go far in the Gas Industry.

Hon. Secretary, President-Elect, President, Mr. R. W. Cowie (Hawick), and Mr. John Richmond (Penicuik).

Mr. SHIELL thanked Mr. Cowie for proposing his health and the members for the kind way in which they had responded. He appreciated the reference to his family.

Bowling and Golf.

On Thursday a bowling competition was held on the Dalkeith Bowling Club's Green at Dalkeith. The winning rink who triumphed by 18 shots was composed as follows:

Messrs. J. Richmond (Penicuik), Boyd Workman (Saltcoats), J. Nelson (New Battle Colliery), R. J. Philp (North Berwick), skip.

The annual golf outing was held the same day over the Newbattle Golf Course, Dalkeith. The first handicap prizewinner in Section I. was F. Keillor, of Comrie, and second J. S. Ford, of Glasgow. In Section II., the first handicap prize was won by J. D. Couper, of Glasgow, and the second by L. Gardner, of Lenzie.

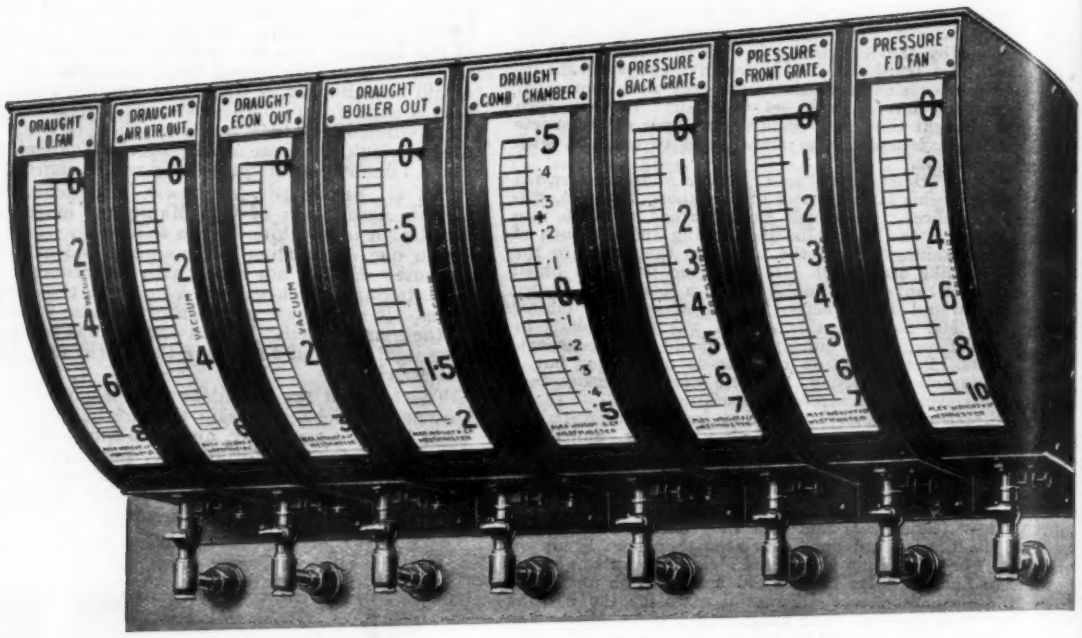


Illustration shews the third set of Indicators supplied to a large power station in South Africa. A similar arrangement can readily be employed for bringing together the many indicating points on Gas Works and Coke Oven Plant. Front-mounting or semi-flush mounting can be arranged for any number of points, and ranges to cover customers' own particular requirements.

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Gas Markets and Manufactures

Stock Market Report

(For Stock and Share List, see later page)

The Stock Exchange had a busy time last week. Industrials were again the centre of activity, and though profit-taking was in evidence towards the close the large support soon counteracted any reaction in prices. It is satisfactory to note that, despite the continued demand for these securities, the values of British Funds and other safety-first stocks have also shown a hardening tendency. The results of recent issues by municipal authorities clearly indicate that the Treasury's cheap money policy is anticipated to continue, as large sums are forthcoming on a sound investment giving a clear 3% return, which supports the contention that in the near future this yield will be unobtainable on any trustee security.

Throughout the activity in the Industrial section the Gas Market has remained firm with a steady volume of business, and last week was no exception to the general rule. It will be seen in the Stock and Share List that, apart from a number of seasonal *ex* interest reductions, there were very few price changes. The ordinary and preference shares of the Severn Valley Gas Corporation, Ltd., are now officially quoted on the London Exchange and have, therefore, been added to the List.

In the light of present-day values the high yields now obtainable on many Gas ordinary stocks clearly indicate that, for the security offered, some improvement in prices is justified, for, with the exception of Gas Light units, on which the return is 4%, the average yields are round about 4½%, while in the case of several leading companies it is nearer 5%.

The Directors of the Wolverhampton Gas Company are offering for sale by tender £30,000 Consolidated Ordinary stock at a minimum price of £150%, at which price the yield, based on the present dividend of 7%, the rate paid since 1923, works out at £4 13s. 4d.%. The last day for the receipt of tenders is Monday next, July 8.

Current Sales of Gas Products

The London Market for Tar Products.

July 1.

There is practically no change to report in the prices of Tar Products during the past week.

Pitch is nominal 35s. per ton f.o.b.

Creosote, about 5¼d. to 6d. per gallon.

Refined tar, 4d. per gallon in bulk at makers' works.

Pure toluole, 2s. 2d. to 2s. 3d.; pure benzole, 1s. 7d. to 1s. 8d.; 95/160 solvent naphtha, 1s. 5d.; and 90/160 pyridine, about 4s. 6d. to 4s. 9d.—all per gallon naked at works.

Tar Products in the Provinces.

July 1.

The average prices of gas-works products during the week were: Gas-works tar, 18s. to 23s. Pitch—East Coast, 31s. to 33s. f.o.b. West Coast—Manchester, Liverpool, Clyde, 31s. to 33s.* Toluole, naked, North, 1s. 8d. to 1s. 9d. Coal-tar crude naphtha, in bulk, North, 6¾d. to 7d. Solvent naphtha, naked, North, 1s. 5d. to 1s. 5½d. Heavy naphtha, North, 9½d. to 10½d. Creosote, *ex* works, in bulk, North, liquid and salty, 5⅜d. to 5½d.; low gravity, 5d. to 5⅜d.; Scotland, 5d. to 5⅜d. Heavy oils, in bulk, North, 5d. to 5¼d. Carbolic acid, 60's, 1s. 11d. to 2s. Naphthalene, £10 to £11. Salts, 60s. to 75s., bags included. Anthracene, "A" quality, 2½d. to 3d. per minimum 40%, purely nominal; "B" quality, unsalable.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls whatever they may be.

Tar Products in Scotland.

GLASGOW, *June* 29.

Very little change has taken place in market conditions in this area during the week. While quotations are fairly steady new business continues rather scarce.

Crude gas-works tar.—The actual value is 28s. to 30s. per ton *ex* works in bulk.

Pitch continues dull with prices nominal at 37s. 6d. per ton f.o.b. Glasgow for export, and 35s. to 37s. 6d. per ton *ex* works in bulk for home trade.

Refined tar is still quoted freely at 3d. per gallon f.o.r. makers' works in buyers' packages.

Creosote oil is a bright feature with prices not lower than the following: B.E.S.A. Specification, 5⅛d. to 5⅜d. per gallon; low gravity, 5⅛d. to 5⅛d. per gallon; and neutral oil, 5¼d. to 5⅛d. per gallon; all f.o.r. in bulk.

Cresylic acid.—This is only being produced as required, and, in the absence of serious enquiry, prices are unstable. Pale, 97/99%, 1s. 1½d. to 1s. 2½d. per gallon; dark, 97/99%, 1s. to 1s. 0½d. per gallon; and pale, 99/100%, 1s. 2½d. to 1s. 3½d. per gallon; all *ex* works naked.

Crude naphtha.—Value of this is steady at 4½d. to 5d. per gallon, according to quality and district.

Solvent naphtha.—90/160 grade is 1s. 3½d. to 1s. 4d. per gallon, and heavy naphtha, 90/190, is 10½d. to 11½d. per gallon.

Motor benzole is now well looked after at 1s. 3d. to 1s. 3½d. per gallon in bulk at makers' works.

Pyridine.—90/160 grade is 5s. 6d. to 6s. per gallon, and 90/140 grade, 6s. to 6s. 6d. per gallon.

Benzole Prices.

These are considered to be the market prices for benzole at the present time:

	s.	d.		s.	d.		
Crude benzole . . .	0	9½	to	0	10	per gallon	at works
Motor ,, . . .	1	3	,,	1	3½	,,	,, ,,
90% ,, . . .	1	4	,,	1	4½	,,	,, ,,
Pure ,, . . .	1	7½	,,	1	8	,,	,, ,,

Contracts Advertised To-Day

Coal.
Belfast Gas Department. [p. 57.]
Marple Gas Department. [p. 57.]
Workington Gas Department. [p. 57.]

Coke Screening Plant.
Warrington Gas Department. [p. 57.]

Compressor.
Barnoldswick Gas Department. [p. 57.]

Main Laying.
Barnoldswick Gas Department. [p. 57.]

Pipes, &c.
Barnoldswick Gas Department. [p. 57.]

Tar.
Sileby Gas Light and Coke Company, Ltd. [p. 57.]

Trade Notes

New "S. & L." Catalogues.

Two catalogues have recently been published by Messrs. Stewarts & Lloyd, Ltd. One is entitled "Steel Tubes in the Public Service" and, as its name implies, deals with the many ways in which steel tubes are serving the community. While probably of more than ordinary interest to municipal officials, it is also likely to prove useful to officials of gas and other public utility undertakings, as it contains information covering those spheres. The second catalogue, "Steel Pipes for Water, Gas, and Sewage," contains a brief summary of the more important points in connection with steel pipes for water and gas, together with full dimensional data as given in the British Standard Specification No. 534.

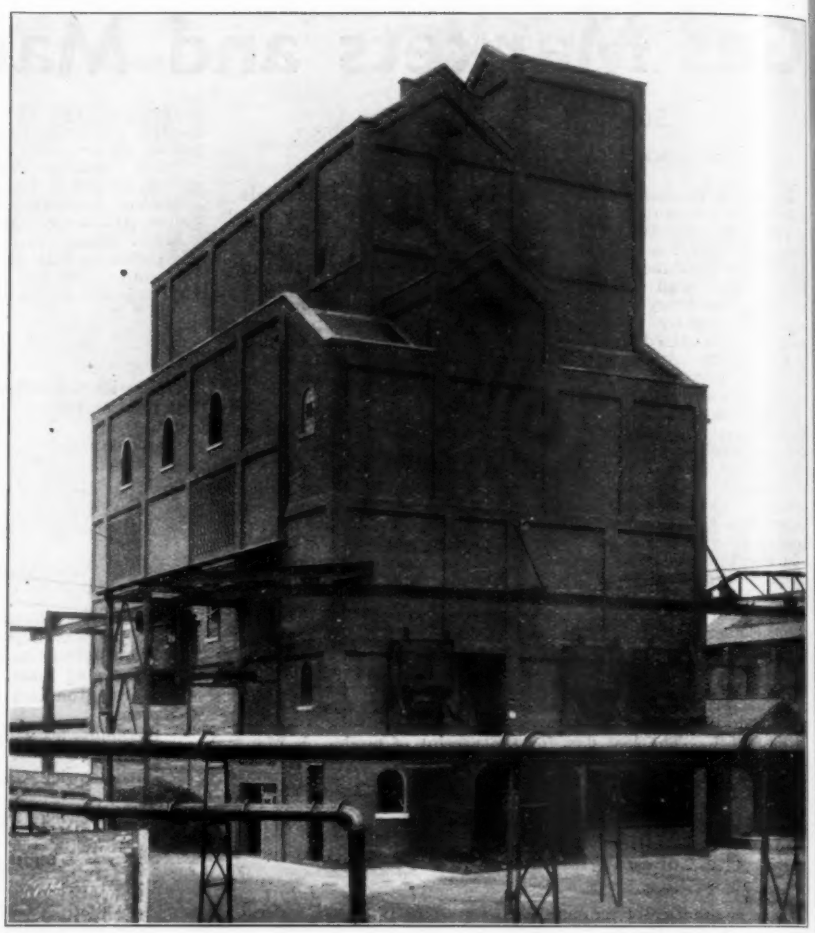
Automatic Street Lighting.

The "Gunfire" system of automatic lighting control is fully explained in the new catalogue of the British, Foreign, and Colonial Automatic Light Controlling Company, Ltd., of Bournemouth, which we recently received from that Company. The year 1897 saw the first "Gunfire" apparatus produced in practical form by the inventor—the late Mr. John Gunning, who was the pioneer of the present system which is now known the world over. The essential feature of this system is that it is of simple mechanical construction—strong, reliable, and of the best quality, representing the highest degree of accuracy. "Gunfire" controllers are supplied on purchase outright, but the manufacturers are also prepared to supply them on extended purchase terms, or to hire at an annual rental charge.

Works Costing by Machine.

Continuous and automatic records of manufacturing processes and the output of plants is the subject dealt with in a publication recently received from Messrs. Evershed & Vignoles, Ltd., the electrical engineers and instrument makers of Acton Lane Works, Chiswick, W. 4. This booklet describes instruments, by the use of which estimating and guesswork in factory management can be abolished and a record obtained showing, from minute to minute, the precise output of a product or the performance of a machine. This is illustrated with examples of the various recording instruments which the company have perfected. An immense variety of measurements can be recorded. For example, a gas-works superintendent or blast furnace supervising engineer can obtain continuous records of gas output. This may be from several furnaces, from different groups of retorts, or ovens, and the record may be on one or several charts.

ILLUSTRATION: GLOVER-WEST VERTICAL RETORT PLANT RECENTLY BUILT FOR THE EAST HULL GAS COMPANY



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STOCK AND SHARE LIST

Official Quotations on the London and Provincial Stock Exchanges

Issue. £	Share	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations, June 28.	Rise or Fall on Week.	Transactions, Lowest and Highest Prices During the Week.
1,551,868	Stk.	Mar. 11	7	7	Alliance & Dublin Ord. ...	130—140	...	138—139
374,000	,,	June 24	4	4	Do. 4 p.c. Deb. ...	90—100*	...	...
557,655	,,	Feb. 18	7	7	Barnet Ord. 7 p.c.	165—170	...	...
300,000	1	Apl. 8	1/4⅜	1/9⅜	Bombay, Ltd.	27/6—29/6	...	...
178,480	Stk.	Feb. 18	9½	9½	Bournemouth sliding scale ...	220—230	...	...
550,050	,,	,,	7	7	Do. 7 p.c. max. ...	168—173	+1	171½—172½
439,160	,,	,,	6	6	Do. 6 p.c. Pref. ...	147—152	...	149—152
50,000	,,	June 24	3	3	Do. 3 p.c. Deb. ...	85—90*	−1	...
262,025	,,	,,	4	4	Do. 4 p.c. Deb. ...	103—108*	−2	...
335,000	,,	,,	5	5	Do. 5 p.c. Deb. ...	123—128*	−2	...
357,900	,,	Feb. 18	7½	7½	Brighton, &c., 6 p.c. Con. ...	173—178	...	176—176½
649,955	,,	,,	6½	6½	Do. 5 p.c. Con. ...	153—158	...	...
205,500	,,	,,	6	6	Do. 6 p.c. B. Pref.	145—150	...	...
1,487,500	,,	Feb. 4	5	5	Bristol, 5 p.c. max.	121—123*a*	...	...
120,420	,,	June 7	4	4	Do. 1st 4 p.c. Deb. ...	100½—102½*a*	...	...
217,870	,,	,,	4	4	Do. 2nd 4 p.c. Deb. ...	100½—102½*a*	...	...
328,790	,,	,,	5	5	Do. 5 p.c. Deb.	123—125*a*	...	...
855,000	,,	Mar. 11	7	8	British Ord.	154—159	...	155½
100,000	,,	June 7	7	7	Do. 7 p.c. Pref.	160—165	...	163½
350,000	,,	,,	5½	5½	Do. 5½ p.c. "B" Cum. Pref.	112—117	...	...
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb. ...	95—100	...	...
450,000	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	109—114	...	112½
100,000	10	22 May '33	6	4	Cape Town, Ltd.	1—3	...	...
100,000	10	6 Nov.'33	4½	4½	Do. 4½ p.c. Pref. ...	1—3	...	...
150,000	Stk	June 24	4½	4½	Do. 4½ p.c. Deb. ...	83—88*	−2	...
626,860	,,	Jan. 21	6	6	Cardiff Con. Ord.	130—135	...	...
237,860	,,	June 7	5	5	Do. 5 p.c. Red. Deb.	103—108	...	...
157,150	,,	Feb. 4	5	6½	Chester 5 p.c. Ord.	111—116*b*	...	...
98,936	1	Mar. 25	2/-	2/-	Colombo, Ltd., Ord.	1⅞—1⅞	...	...
24,500	1	,,	1/4½	1/4½	Do. 7 p.c. Pref. ...	20/6—22/6	...	...
609,204	1	Mar. 25	-/11·48	-/11·48	Colonial Gas Assn. Ltd. Ord.	20/6—22/6	...	...
296,053	1	,,	1/3·30	1/3·30	Do. 8 p.c. Pref.	26/—28/-	...	27/1⅞
1,775,005	Stk	Feb. 4	5	6	Commercial Ord.	105—110	...	105—106½
475,000	,,	June 7	3	3	Do. 3 p.c. Deb. ...	85—90*	...	86—87½
286,344	,,	Feb. 18	5	5	Do. 5 p.c. Deb. ...	123—128	...	124—125½
807,560	,,	Feb. 18	7	7	Croydon sliding scale...	155—160	...	157—157½
569,590	,,	,,	5	5	Do. max. div.	112—117	...	116
620,385	,,	June 24	5	5	Do. 5 p.c. Deb. ...	123—128*	−2	...
542,270	,,	Feb. 18	7	10	Derby Con.	185—195*c*	...	...
55,000	,,	June 24	4	4	Do. 4 p.c. Deb.	100—105*c**	...	...
239,000	,,	Feb. 4	5	5	East Hull Ord. 5 p.c. ...	108—113	...	...
181,625	,,	Feb. 4	6	6	East Surrey Ord 5 p.c. ...	131—136	...	...
175,609	,,	June 7	5	5	Do. 5 p.c. Deb. ...	118—123	...	...
1,002,180	,,	Mar. 11	†	†7	European, Ltd.	170—180	...	174—176½
19,313,481	,,	Feb. 4	5½	5½	Gas Light & Coke 4 p.c. Ord.	27/6—28 6*f*	...	27/9—28/1½
2,600,000	,,	,,	3½	3½	Do. 3½ p.c. max.	85—90	...	...
4,477,106	,,	,,	4	4	Do. 4 p.c. Con. Pref. ...	106—111	...	109½—111
8,602,497	,,	June 7	3	3	Do. 3 p.c. Con. Deb. ...	87—92	...	88—90½
3,642,770	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	113—118	...	115⅝
3,500,000	,,	,,	4½	4½	Do. 4½ p.c. Red. Deb. ...	109—114	...	112½—113
270,466	,,	Feb. 18	6	6	Harrogate New Cons. ...	135—140	...	...
140,000	1	Mar. 25	1/7½	1/7½	Hongkong & China, Ltd. ...	1½—1½	...	...
213,200	Stk.	Feb. 18	6	6	Hornsey Con. 3½ p.c....	128—138	...	...
5,600,000	,,	May 13	10	14	Imperial Continental Cap. ...	215—220	...	216½—219
223,130	,,	Jan. 21	3½	3½	Do. 3½ p.c. Red. Debs.	91—96	...	...
285,242	,,	Feb. 18	8½	8½	Lea Bridge 5 p.c. Ord. ...	175—185	...	...
2,167,410	,,	Feb. 18	6	6	Liverpool 5 p.c. Ord....	136—140*b*	...	...
245,500	,,	June 7	5	5	Do. 5 p.c. Red. Pref. ...	105—110*b*	...	...
306,083	,,	Jan. 16	4	4	Do. 4 p.c. Deb. ...	104—107*b*	...	...
165,736	,,	Feb. 18	8	10	Maidstone 5 p.c. Cap. ...	185—195	...	...
63,480	,,	June 24	3	3	Do. 3 p.c. Deb. ...	82—87*	−1	...
75,000	,,	May 27	†10	†10	Malta & Mediterranean ...	212—222*	+2	...
392,000	—	Apl. 1	5½	5½	Metropolitan (of Melbourne) 5½ p.c. Red. Deb.	100—105	...	...
231,978	Stk.	Feb. 4	5	5	M. S. Utility "C" Cons. ...	110—115	...	...
818,657	,,	,,	4	4	Do. 4 p.c. Cons. Pref.	102—107	...	105—106
360,075	,,	June 24	4	4	Do. 4 p.c. Deb. ...	103—108*	...	...
148,955	,,	,,	5	†5	Do. 5 p.c. Deb. ...	123—128*	−2	...
125,000	—	Jan. 2	11/8	3½	Do. 3½ p.c. Rd. Rg. Bds.	98—101	−1	...
675,000	,,	June 24	†‡3	†‡3	Montevideo, Ltd.	48—58*	...	48—53
2,061,315	,,	Feb. 18	5	5½	Newcastle & Gateshead Con.	25 9—26 9*df*	...	...
682,856	,,	,,	4	4	Do. 4 p.c. Pref. ...	106—107*d*	...	...
776,706	,,	June 7	3½	3½	Do. 3½ p.c. Deb. ...	100—101*d*	...	...
277,285	,,	Oct. 8	5	5	Do. 5 p.c. Deb. '43 ...	105—107*d*	...	...
274,000	,,	Feb. 4	5	5	Newport (Mon.) 5 p.c. max....	115—120*a*	...	...
225,000	,,	Feb. 18	7½	7½	North Middlesex 6 p.c. Con.	165—175	...	172
396,160	,,	Feb. 4	5	5	Northampton 5 p.c. max. ...	105—110	...	...
300,000	,,	Apl. 29	†9	†7	Oriental, Ltd.	167—172	...	...
416,617	,,	June 7	8	8	Plym'th & Stonehouse 5 p.c.	162—167	...	...
504,416	,,	Feb. 4	8	8½	Portsm'th Con. Stk. 4 p.c. Std.	173—178	2	174—176
241,446	,,	,,	5	5	Do. 5 p.c. max. ...	110—115	...	...
114,000	,,	Jan. 21	5	5	Preston 5 p.c. Pref.	108—113	...	...
269,939	1	Apl. 8	...	...	Severn Val. Gas Cor. Ld. Ord.	21 9—22 9	...	22/3
302,781	1	Mar. 25	...	...	,, ,, 4½ p.c. Cum. Pref.	21,9—22 9	...	...
1,736,968	Stk.	Feb. 18	6	6	Sheffield Cons.	142—144*e*	...	...
95,000	,,	June 24	4	4	Do. 4 p.c. Deb.	102—104*e**	−1½	...
133,201	,,	Feb. 18	8½	5	Shrewsbury 5 p.c. Ord. ...	142—147	...	...
90,000	10	May 27	‡3	‡3½	South African	3—4	...	...
1,061,779	1	May 13	1/2‡	1 2‡	South East'n Gas Cn. Ld. Ord.	27/—29/-	...	28/6—28 9
845,016	1	Mar. 11	-/10‡	- 10‡	Do. 4½ p.c. Red. Cum. Pref.	22'—23/-	...	22/9—23/-
450,000	Stk.	Feb. 4	7¼4	4	Do. 4 p.c. Red. Deb. ...	100—103	...	...
6,709,895	,,	Feb. 4	5	6½	South Met. Ord.	123—128	...	123—125½
1,135,812	,,	,,	6	6	Do. 6 p.c. Irred. Pf. ...	147—152	...	...
850,000	,,	,,	4	4	Do. 4 p.c. Irred. Pf. ...	104—109	...	...
1,895,445	,,	June 24	3	3	Do. 3 p.c. Deb. ...	86—91*	−1	87½—88¾
1,000,000	,,	Jan. 7	5	5	Do. 5 p.c. Red. Deb....	113—118	...	117½
209,820	,,	Feb. 18	8½	8½	South Shields Con.	174—176*d*	...	...
1,543,795	,,	Feb. 18	6	6	South Suburban Ord 5 p.c. ...	130—135	...	...
512,825	,,	,,	5	5	Do. 5 p.c. Pref. ...	121—126	...	...
500,000	,,	,,	4	4	Do. 4 p.c. Pref. ...	105—110	...	108½—109
888,587	,,	June 7	5	5	Do. 5 p.c. Deb. ...	122—127	...	...
250,000	,,	,,	4	4	Do. 4 p.c. Deb. ...	102—107	...	...
647,740	,,	Feb. 4	5	5	Southampt'n Ord. 5 p.c. max.	116—121	+2	120
121,275	,,	June 7	4	4	Do. 4 p.c. Deb.	100—105	...	...
350,000	,,	Feb. 4	5½	5½	Swansea 5½ p.c. Red. Pref. ...	115—120	...	...
200,000	,,	June 7	6½	6½	Do. 6 p.c. Red. Deb. ...	98—103	...	...
1,076,490	,,	Feb. 18	6½	6½	Tottenham and District Ord.	148—153	...	149
409,835	,,	,,	5½	5½	Do. 5½ p.c. Pref. ...	131—136	...	135½—135¾
62,235	,,	,,	5	5	Do. 5 p.c. Pref. ...	120—125	...	...
199,005	,,	June 7	4	4	Do. 4 p.c. Deb. ...	101—106	...	...
369,774	,,	Feb. 4	7	7	Uxbridge, &c., 5 p.c.	150—155	...	151
108,330	,,	,,	5	5	Do. 5 p.c. Pref. ...	118—123	...	...
1,326,700	,,	Feb. 4	7	7	Wandsworth Consolidated ...	155—160	...	153½—159½
1,371,373	,,	,,	5	5	Do. 5 p.c. Pref. ...	121—126	...	122¾
1,317,964	,,	June 7	5	5	Do. 5 p.c. Deb. ...	124—129	...	...
208,300	,,	,,	26/8	4	Do. 4 p.c. Deb. ...	102—107	...	...
158,400	,,	Feb. 18	5	6g	Winchester, W. & G. 5 p.c. Con.	116—121	...	...

Quotations at :—*a.*—Bristol. *b.*—Liverpool. *c.*—Nottingham. *d.*—Newcastle. *e.*—Sheffield. *f.*—The quotation is per £1 of Stock. *g.*—Paid £3, including 10s. on account of back dividends. * Ex. div. † Paid free of income-tax. ‡ For year.

STOCK FOR SALE BY TENDER.

By Order of the Directors.

THE REDDITCH GAS COMPANY.

Messrs. A. & W. RICHARDS

are Instructed to OFFER FOR SALE BY TENDER

£25,000

FOUR PER CENT. REDEEMABLE DEBENTURE STOCK,

to be redeemed at Par at the Company's option on 31st July, 1955.

Minimum Price of Issue, Par.

Prospectus and Form of Tender (which latter must be sent in by 11 o'clock on Thursday, 11th July) may be obtained of A. & W. RICHARDS, 37, WALBROOK, E.C. 4.

COMPANY NOTICES.

SOUTH SUBURBAN GAS COMPANY.

NOTICE is Hereby Given that the TRANSFER BOOKS relating to the ORDINARY and PREFERENCE STOCKS of this Company WILL BE CLOSED from the 13th July to 26th July, both days inclusive.

By order of the Board,
T. BROWN,
Secretary.

Chief Office,
Lower Sydenham, S.E. 26,
June 29, 1935.

COMMERCIAL GAS COMPANY.

NOTICE is Hereby Given that the TRANSFER BOOKS of this Company, so far as they relate to ORDINARY STOCK, WILL BE CLOSED from the 8th July to 7th August, both days inclusive.

By order of the Board,
F. J. BRADFIELD,
General Manager and Secretary.

Offices,
Stepney, E. 1,
June 25, 1935.

PATENTS.

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CHARTERED PATENT AGENTS AND TRADE MARK AGENTS,
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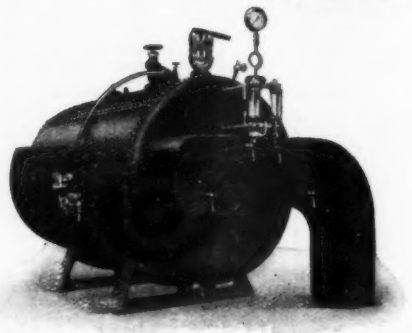

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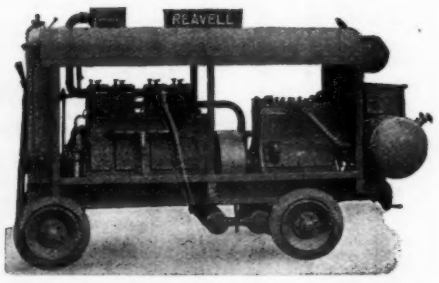

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Prospectus will be forwarded free on application to THE REGISTRAR, COLLEGE OF TECHNOLOGY, MANCHESTER, 1.

CONTRACTS OPEN.

BOROUGH OF WORKINGTON.

(GAS DEPARTMENT.)

TENDERS FOR GAS COAL.

THE Workington Town Council are prepared to receive TENDERS for the Supply of 10,500 Tons of GAS COAL, for delivery over the Twelve Months ending the 31st August, 1936.

Particulars and Forms of Tender may be obtained on application to Mr. Hedley Hoy, Engineer and Manager, Gas-Works, Workington.

The Council do not bind themselves to accept the lowest or any Tender, and reserve to themselves the right to accept the whole or any part of the Tender.

Tenders to be enclosed in plain sealed envelopes, endorsed "Tender for Gas Coal," to be addressed to the undersigned, and delivered at the Town Hall, Workington, not later than Twelve noon on Monday, 22nd July, 1935.

THOMAS JACKSON,
Town Clerk.

Town Hall,
Workington,
July 3, 1935.

J. & J. BRADDOCK (Branch of Meters Limited), Globe Meter Works, OLDHAM, and 45 & 47, Westminster Bridge Road, LONDON, S.E. 1.

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SHEFFIELD.

CITY AND COUNTY BOROUGH OF BELFAST.

(GAS DEPARTMENT.)

TENDERS are invited for the Supply of approximately 175,000 Tons of GAS COAL, to be delivered free, and trimmed, in Barges at Belfast Harbour between 1st September, 1935, and 31st August, 1936.

Conditions and Forms of Tender may be had on application to the Engineer and Manager, Gas-Works, Ormeau Road, Belfast.

Tenders, enclosed in sealed envelopes, endorsed with the name and address of the firm tendering, and marked "Tender for Gas Coal, Gas Department," to be lodged in the Office of the undersigned not later than Five p.m. on Thursday, 8th August, 1935.

An Official Receipt must be obtained for every Tender delivered by hand. Tenders sent by post should be registered.

The lowest or any Tender will not necessarily be accepted.

The whole or any part of a Tender may be accepted.

R. MEYER,
Town Clerk.

MARPLE URBAN DISTRICT COUNCIL.

(GAS DEPARTMENT.)

GAS PEAS, BEANS, SLACK, &c.

THE above-named Council invite TENDERS for the Supply of GAS PEAS, BEANS, SLACK, &c., as required at their Gas-Works, Marple Bridge, during the Twelve Months ending 31st August, 1936.

Forms of Tender and Conditions upon which Tenders only will be received may be obtained upon application to Mr. J. K. Law, Gas Engineer, Marple Bridge, near Stockport.

Tenders, endorsed "Coals," and addressed to the Chairman of the Stores Committee, to be delivered at the Council Offices, Marple, by Four o'clock in the afternoon on Saturday, the 17th August, 1935.

No Tender will be received except in a plain sealed envelope, which must not bear any name or mark indicating the sender.

The Council do not bind themselves to accept the lowest or any Tender.

JAMES FREEMAN,
Clerk of the Council.

Council Offices,
Marple,
Cheshire,
June 25, 1935.

THE Warrington Corporation Gas Department invite TENDERS for COKE SCREENING PLANT, to be erected above existing Ferro Concrete Hoppers. Alternative schemes and quotations may be submitted.

A General Specification of the Plant required and a Drawing of the existing Ferro Concrete Hoppers will be supplied by the undersigned on the payment of One Guinea, which will be returned on receipt of a *bona fide* Tender.

Tenders, endorsed "Coke Screens," and bearing no indication of the sender, to be addressed to the Chairman, Gas Committee, Town Hall, Warrington, and to be received not later than the first post on July 22nd, 1935.

(Signed) A. COOK, M.Inst.Gas E.
Gas Department Offices,
Mersey Street,
Warrington.

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BARNOLDSWICK URBAN DISTRICT COUNCIL.

(GAS DEPARTMENT.)

THE above Council invite Tenders for the Supply and Delivery at the Barnoldswick Railway Station of 1,650 Yards of 4 In. SPUN-IRON GAS MAIN, with Joints suitable for High-Pressure Gas and Coated outside only. Class B.

Also Three 90° BENDS and Three 10-Gallon SYPHONS, to suit above.

All to comply with British Standards Specification.

Separate Tenders are also invited for LAYING the Main above mentioned, and also for Testing the necessary Joints on site. The Contractor to employ local labour as far as possible.

Tenders are also invited for the Supply, Delivery, and Erection, at the Council's Gas-Works, of a GAS COMPRESSOR, capable of passing 50,000 cubic feet per hour at 15 lbs. per square inch outlet pressure, together with the Governors, &c., and 6 in. Inlet and Outlet Valves.

Further particulars may be obtained from the Council's Engineer (H. Spencer, Esq., M.Inst. Gas E.), Gas-Works, Barnoldswick.

Sealed Tenders, endorsed "Gas Main," "Main Laying and Testing," or "Gas Compressor," as the case may be, must be forwarded so as to reach the undersigned not later than Ten a.m. on Monday, the 15th July, 1935. Tenders must be enclosed in envelopes not bearing any name or mark indicating the sender.

Forms of Tender are not issued.

The Council do not bind themselves to accept the lowest or any Tender.

ROBERT W. FENTON,
Clerk of the Council.

Town Hall,
Barnoldswick,
via Colne.

THE Directors of the Sileby Gas Light and Coke Company require TENDERS for the PURCHASE of their SURPLUS TAR during the year ending June 30, 1936.

Tenders, addressed to the Chairman, must be received by first post on July 9, 1935.

Tar from Horizontals, South Yorkshire Coal, about 10 tons per month.

N. W. MOORE,
Engineer and Manager.

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Full particulars in strict confidence to No. 8,546, "GAS JOURNAL," 11, BOLT COURT, FLEET STREET, E.C. 4.

Continued on next page.

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Co-Partnership and Pension Schemes in operation.
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INDUSTRIAL ASSISTANT.

APPLICATIONS are invited for the Position of INDUSTRIAL ASSISTANT to the District Superintendents. Experience in the Industrial Uses of Gas essential. Minimum commencing Salary, £200 per Annum.
Applications, giving full details of Experience, Age, and Salary required, to the ENGINEER, GAS COMPANY, DUDLEY, WORCS.

NORTHAMPTON GASLIGHT COMPANY.

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APPLICATIONS are invited for the Position of SHOWROOM ASSISTANT.
Candidates must have had previous Experience and Training in Gas Showrooms.
Applications, stating Age, Experience, and Qualifications, accompanied by *copies* of Two recent Testimonials, and stating Salary required, and when at Liberty to Commence Duties, addressed to THE MANAGER, NORTHAMPTON GASLIGHT COMPANY, ABINGTON STREET, NORTHAMPTON.
June 27, 1935.

A GAS Company requires the Services of an INSPECTOR to Control and Supervise the Mains and Service Work on the District up to the inlet of the Consumers' Meter.
Application, stating Age, Experience, and Salary required, to No. 8,544, "GAS JOURNAL," 11, BOLT COURT, FLEET STREET, E.C. 4.

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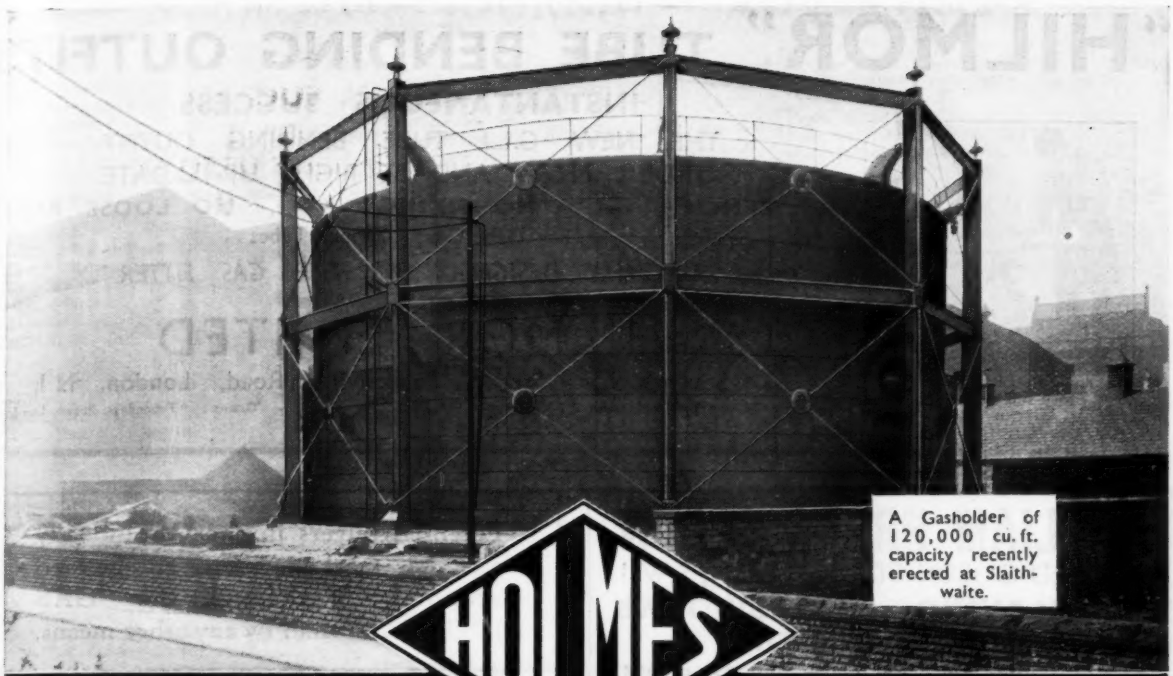

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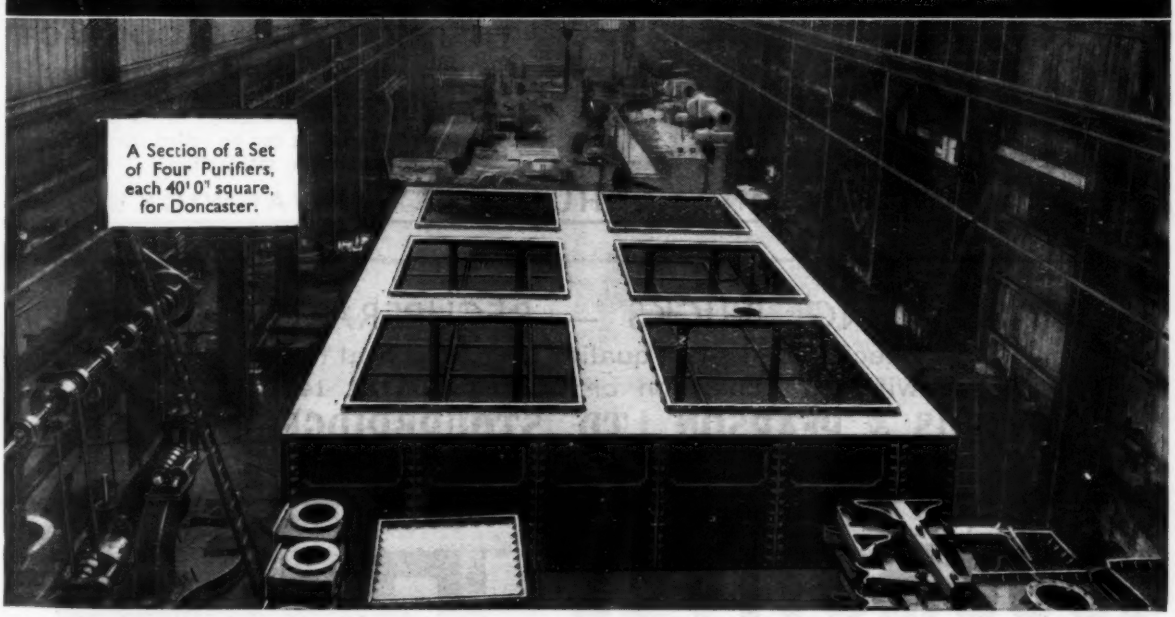

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